FOR RICHER FIELDS

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AMPLE PESTICIDE SUPPLIES SEEN FOR 1955 SEASON

Fertilizer Tonnage Up in Mountain, Northwest States, NFA Survey Shows

WASHINGTON — Fertilizer tonage sold in the Mountain and Pafic Northwest states from last July appears to be about 3% greater an for the corresponding period year earlier, according to a spot rvey conducted by the National rtilizer Assn.

Tonnage for the area may be up y as much as 5% for the full rtilizer fiscal year which ends une 30, according to the survey.

On a plant food basis, reports incate that sales, both to date and r the fiscal year, probably will be ven higher by a few per cent. Inreased use of anhydrous and aqua mmonia and other high analysis maerials appears to be one factor in oosting the plant food average, acording to the reports.

Results of the survey are reported the current issue of Fertilizer News, NFA publication. It is the third area spot survey to be made. Results of a survey of the South, South Central and California-Arizona areas appeared on page 1 of the April 11 issue of Croplife; a story of the survey of the northern half of the U.S. east of the Rockies appeared on page 1 of the April 25 issue.

NFA will make a final survey of the entire U.S. early in June.

Following is from the NFA report of its most recent survey of Mountain and Pacific Northwest states. The survey results are based on reports from fertilizer concerns doing business in the area.

A number of reporting companies indicated that sales of mixed fertilizers are not keeping pace with the over-all trend. This is particularly true in some areas, such as western Washington where increasing use of liquids is mentioned as a cause.

For the Pacific Northwest States of Oregon, Washington and Idaho, considered as a whole, tonnage sales to date appear to be 5-6% greater than in the same period of 1953-54. For the year ending June 30, reports indicate sales on a tonnage basis may reach a total 6-7% above the previous year.

Adverse weather conditions have slowed spring sales in western Washington, however, and there seems to be some question as to whether the lost tonnage will be made up before the end of the year. The opposite seems to be true in western Oregon where it's reported that late winter weather has been more conducive to sales.

Total sales to date in the Mountain area, comprising Montana, Wyoming,

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Vorhes Chemical $200,000 Plant Under Construction

CHARLES CITY, IOWA — The $200,000 fertilizer mixing plant of the new Vorhes Chemical Corp. here is expected to be completed by Sept. 1, an official of the firm told Croplife last week.

Officials of the new company include Ralph Zastro, Charles City, president; H. S. Vorhes, Dubuque, executive vice president and general manager; F. Robert Kerrigan, Redwood Falls, Minn., secretary; Mertin Claus, Charles City, treasurer; John M. Vorhes, now in the army, foreman, and James R. Kerrigan, Dubuque, cashier.

H. S. Vorhes, who currently is sales manager at Dubuque for Virginia-Carolina Chemical Corp., is president of the Middle West Soil Improvement Committee. He has been in the fertilizer business 35 years. F. Robert Kerrigan also is with Virginia-Carolina at Redwood Falls.

The new structure will be a complete dry mix processing plant, with facilities for eventual production of superphosphate.

Stedman Foundry & Machine Co., Inc., Aurora, Ind., is supplying the plant equipment.

Pesticide Use Can Increase 00%, Speaker Tells Members Of Carolinas-Virginia Group

By PAUL L. DITTEMORE
Croplife Editorial Staff

RALEIGH, N.C.—An increase of 00% in the amount of insecticides ought by North Carolina farmers n safely be anticipated in the com- 10 years, Dr. Clyde F. Smith, head the department of entomology, orth Carolina State College, told e members of the newly-formed arolinas-Virginia Pesticide Formutors Assn. at the first meeting of e organization here May 3-4.

In his address, entitled "The Future of Our Industry," Dr. Smith dded that similar gains could be nticipated in the fields of plant athology and herbicides. He estiated the present dollar volume of secticides sold in North Carolina t $7 million and said that some stimates have placed that figure high as $10 million.

The entomologist based his estiate upon the development of more effective insecticides, continuance of the educational program in the use of insecticides and the improvement in agricultural practices generally in his state. He pointed out that development of improved cultural practices, increase in population and the demand for an increase in agricultural output all will contribute to increased use of pesticides.

In connection with that expansion, Dr. Smith predicted that the department of entomology at the state college would, in 10 years, be twice as large as it is today, both in personnel

(Continued on page 8)

INSECT, PLANT DISEASE NOTES

See Page 4

Ketona to Erect Facilities for Nitrogen Solutions

KETONA, ALA.—Ketona Chemical Corp. has announced that the Fluor Corporation, Ltd., Los Angeles, has been awarded a further contract to design, engineer and construct facilities for the production of nitrogen solution (ammoniated nitrate of ammonia) at Ketona's plant site near Tarrant and close to Birmingham.

These added facilities are in addition to the ammonia synthesis unit previously announced. (See page 4 of the Oct. 25 issue of Croplife.)

The Ketona plant, jointly owned by Alabama By-Products Corp., Birmingham, and Hercules Powder Co. Wilmington, Del., will begin production of ammonia in the late fall, and of solutions early in 1956.

WASHINGTON — Supplies of insecticides, fungicides and weed killers generally will be ample in 1955 to meet domestic requirements for pest control, according to "The Pesticide Situation for 1954-55," issued recently by the U.S. Department of Agriculture. (See Table 1, page 2.) As in other years, however, there is the possibility of temporary or local shortages because of distribution problems, the publication notes.

The report was prepared by Harold H. Shepard, Commodity Stabilization Service, Food & Materials Requirements Division, USDA. Following is a summary.

A few firms have discontinued production of at least some pesticidal chemicals, but adequate capacity remains to manufacture large quantities of nearly all pesticides.

In 1954 production (see Table 2, page 2) was kept as nearly as possible in balance with stocks and probable requirements, being reduced when infestations did not materialize or the main season for domestic consumption was past.

Over-all inventories (see Table 3, page 2) including both technical chemicals and the chemical content of formulations, were about 9% lower Sept. 30, 1954, than on the same date in 1953.

Stocks of technical grades of pesticidal chemicals in the possession of all manufacturers, including mixers, showed on that date a reduction of about 16% from 1953. Inventories of some individual chemicals are somewhat up or down from these levels.

The 1954 season was notable for the drouth conditions which pre-

(Continued on page 2)

Proposed Transport Policy Calls for Overhaul of ICC

By JOHN CIPPERLY
Croplife Washington Correspondent

WASHINGTON—While most observers here are taking a dim view of the recent White House Cabinet Committee report on revisions of the national transportation policy, the Chief Executive himself last week gave another push to this proposal. The President admitted that some details will prove argumentative and possibly provoke heated discussion, but he said the basic principles are commendable and that he "approved of them perfectly and the purposes they announce."

This official endorsement by the Chief Executive throws a new strong light on these recommendations and means they may become a large issue at the next session of Congress.

Trade organization officials here in the plant food industry declined to comment on the effects of the cabinet committee's proposals, but they said that they present a com-

(Continued on page 21)

TABLE 1

Disappearance, Requirements of Some Major Pesticides*

(In thousand pounds)

	Domestic disappearance at producers' level				Requirements for domestic consumption in 1954-55
	1950-51	1951-52	1952-53	1953-54	
Benzene hexachloride†	9,600	11,067	7,085	7,616	8,000-10,000
Calcium arsenate	39,583	4,735	7,000	3,190	3,500-10,000
Copper sulfate‡	122,449	98,182	79,852	74,054	40,000-65,000
2,4-D (acid basis)¶	23,494	25,298	26,122	26,483	25,000-28,000
DDT	72,688	70,074	52,748	45,117	55,000-70,000
Lead arsenate	30,174	17,452	16,000	16,000	16,000-20,000
Parathion¶	4,670	4,511	3,000	3,975	3,500- 4,000
Pyrethrum (flowers)§	7,098	6,729	8,113	7,679	7,000- 7,500
Rotenone (roots)§	7,027	3,520	4,468	6,428	5,000- 6,000
2,4,5-T (acid basis)¶	2,822	2,937	4,625	**	3,000- 3,500

*Based on available information; crop year is from Oct. 1 to the following Sept. 30.
†Gamma isomer basis; includes lindane.
‡Disappearance for all domestic uses, including industrial, calendar year basis; requirements stated for agriculture only but include plant nutrient as well as fungicide use.
¶Export data not being reported separately, figures represent total disappearance at producers' level.
§Imports; includes advanced (powdered), also equivalent of pyrethrum extract imported in 1953-54.
**Figures not available for release.

TABLE 2 Pesticide Production by Calendar Years

(In thousand pounds)

Pesticide	1950	1951	1952	1953	1954*
Benzene hexachloride (gross)	76,698	116,988	†85,090	†57,363	†59,312
Benzene hexachloride (gamma equivalent)	10,200	17,100	†12,800	†8,800	†9,275
Calcium arsenate	45,348	40,900	7,634	7,260	2,758
Copper sulfate	174,600	213,872	189,016	145,434	130,568
2,4-D (acid basis)	14,156	17,671	30,718	25,928	28,408
2,4-D (esters)	9,416	11,592	21,108	18,826	
2,4-D (salts)‡	2,212	5,532	3,933	4,836	¶20,522
DDT	78,150	106,139	99,929	84,366	91,054
Lead arsenate	39,434	25,416	14,286	14,196	15,000
Methyl bromide	2,212	3,711	4,620	6,167	**
Parathion	**	4,638	2,365	2,999	**
Phenothiazine	4,034	5,486	5,914	3,700	**
2,4,5-T (acid basis)	**	2,456	3,398	5,281	2,725
Tetraethyl pyrophosphate (40% basis)	**	1,870	922	229	365
Trichloroacetic acid, salts and esters	1,760	7,487	6,214	**	**
Ziram	1,087	1,511	934	1,152	**

*Preliminary. †Not including lindane. **Not available. ‡Sodium and amine salt. ¶In 1954 esters and salts were represented in a combined figure.
Sources: U.S. Tariff Commission; U.S. Bureau of the Census; U.S. Bureau of Mines.

TABLE 3 Stocks Held in the U.S., Sept. 30*

(In thousand pounds)

Pesticide	Total stocks (technical plus mixtures) in terms of technical		Mixtures only, including concentrates, formulations, etc., in terms of technical	
	1953	1954	1953	1954
Aldrin (60% equivalent)	5,138	2,656	**	**
Benzene hexachloride (gamma, except lindane)	6,046	7,295	2,027	2,543
Calcium arsenate	8,439	6,444	789	835
Captan	**	**	**	**
Chlordane	1,436	1,735	697	831
Chloro-IPC	1,947	1,708	827	700
Copper sulfate	16,560	12,230	2,175	1,737
Cryolite	**	**	95	104
2,4-D (acid equivalent)	10,616	9,228	6,912	6,892
DDD (TDE)	3,458	2,336	**	**
DDT	22,372	27,386	9,549	10,791
Dieldrin	3,038	2,128	**	**
Dithiocarbamates	1,002	1,123	567	538
Heptachlor	1,348	1,011	**	**
Lead arsenate	9,338	6,434	2,702	1,358
Lindane	715	588	127	181
Malathion	234	1,667	135	421
Methoxychlor	165	275	113	212
Organic mercurials	**	**	**	**
Parathion	1,617	2,277	747	900
Sodium chlorate	6,879	6,306	**	**
Sodium TCA	1,230	2,222	**	**
Soil fumigants	**	**	**	**
Sulfur, ground	37,933	32,965	15,653	16,003
2,4,5-T (acid equivalent)	3,014	2,392	1,742	1,552
Toxaphene	15,596	10,188	4,147	4,721
Grand totals	171,330	156,092	56,039	59,301

*In cooperation with National Agricultural Chemicals Assn.; estimated to be 90 to 95% complete.
**Figures not released; stocks reported are included in grand totals.

TABLE 4

Aerial Applications of Dusts and Sprays*

Material and unit	1951	1952	1953
Dusts, 1,000 lb.	254,858	413,098	235,229
Sprays, 1,000 gal.	27,187	36,238	47,019
Defoliants, dry, 1,000 lb.	20,798	15,799	16,250
Defoliants, spray type, 1,000 gal.	7,275	11,215	31,182
Grasshopper controls, dry, 1,000 lb.	2,387	2,330	3,729
Grasshopper sprays, 1,000 gal.	29	201	12
Spraying towns, dry, 1,000 lb.	140	37	198
Spraying towns, liquid, 1,000 gal.	1,163	1,470	583
Total dry material, 1,000 lb.	278,182	431,264	255,406
Total liquids, 1,000 gal.	35,655	49,123	78,796

*Figures for 1954 not yet compiled.
Source: U.S. Civil Aeronautics Administration

PESTICIDE SITUATION

(Continued from page 1)

vailed throughout the South and Southwest. Dry weather reduced sales of insecticides to one half to two thirds of the 1953 volume. Infestations elsewhere and the growing practice of chemical control were responsible in part for a higher overall consumption of insecticides in 1954 than in either 1952 or 1953.

Grasshoppers were serious pests in many midwestern and Rocky Mountain areas. As in 1953, destructive outbreaks of the armyworm occurred in 1954, new areas such as Minnesota and New England suffering heavy attacks.

Losses of corn and small grains from armyworms in Minnesota alone amounted to about $12 million, while savings resulting from control in that state were about $40 million.

Weather often influences insect infestations and fungus infections as a whole more than acreage shifts. In the case of cotton in 1954 the acreage cutback in California had little effect upon pesticide sales while in the South it appears to have been a factor in limiting the use of preemergence herbicides.

Surveys in 1954 showed grasshopper populations to have increased in cropland areas in many midwestern states. In 1955 some six million acres of rangeland may require grasshopper control in the western half of the country.

A tremendous buildup of populations of the European corn borer developed in 1954, especially from central Illinois across Iowa to northeastern Nebraska and the neighboring counties in South Dakota, a potential source of severe damage to the 1955 corn crop.

Aerial applications of pesticides and defoliants have grown to immense proportions in recent years (see Table 4, page 2). Such treatments are made largely to crop land, yet appreciable areas of range and forest also receive applications from the air. The total area reported to have been so treated in 1953, the latest year for which figures are yet available, was 33,922,000 acres.

Allowance being made for the probable proportion of this acreage not in crops and that treated with both defoliants and insecticides, the area of crop land in the U.S. that received aerial applications would be about 7% of the total area in crops. About 3,500 aircraft were flown in these activities for a total of 591,500 hours. The area treated in 1953 from the air in California alone was 3,526,000 acres, of which about 38% was in cotton.

Use of soil insecticides for control of corn rootworm in the Midwest has developed rapidly in the last three seasons (see Table 5, page 3). It has been estimated that 2,465,000 acres of corn in Illinois, Iowa and Nebraska were treated with soil insecticides in 1954. This does not include areas planted with insecticide-treated seed.

According to a survey made recently by the U.S. Department of Agriculture, "the acreage treated one or more times for control of insects, diseases, weeds and brush in 1952 was more than one sixth of the combined acreage of principal crops harvested. It reached a total of around 60 million acres. Cotton treated mainly for insects and small grain crops treated for weeds amounted to half of this acreage."

Information about the quantities of pesticides used for given purposes is not generally available. However, surveys of sales at the manufacturers' level of preparations for use on livestock have been made by the interested trade associations in recent years. The results are summarized in Table 6, page 3.

Production of DDT during the crop year Oct. 1, 1953, through Sept. 30, 1954, was 90,712,000 lb.; in the four-month period October, 1954, through January, 1955, it was 27,380,000 lb.

Exports during the 1953-54 crop year were 42,743,000 lb., compared to 31,905,000 lb. in the previous crop year. About the same amount of DDT was in the possession of manufacturers (both producers and formulators) at the end of September, 1954, as at the same date in 1953. Actual consumption in the U.S. appears to have been about 47,000,000 lb. in 1953-54.

Heavy export movement of DDT during the year offset the quiet domestic market. Further quantities amounting to nearly 17,000,000 lb. are expected to be contracted for export in the first six months of 1955 through GSA purchases.

Projects planned in the western U.S. for 1955 include the treatment of over a million acres of forest with DDT (1 lb. per gallon of diesel oil per acre), largely to control the spruce budworm in eastern Oregon and in New Mexico.

Spraying of 2,000,000 acres or more of balsam fir in New Brunswick and Quebec with DDT in oil will start in June. This project began with the treatment of 200,000 acres in 1952, followed in 1953 by 1,775,000 acres and in 1954 by 1,200,000 acres in northern and central New Brunswick.

Spraying with DDT for gypsy moth control and eradication in May and June, 1954, was done on 1,401,000 acres, largely by aircraft in New England, New York, Pennsylvania and Michigan.

Benzene hexachloride production continued at a reduced level in 1954, the gamma content of all grades except lindane averaging 15.64%. Domestic consumption of all grades except lindane amounted to about 000,000 lb. on a gamma basis.

Despite conditions in 1954 which kept demand for cotton insecticides at a low level, domestic consumption of chlorinated hydrocarbons (aldrin, chlordane, dieldrin, endrin, heptachlor and toxaphene) was 30 to 35% higher than in 1953.

During 1954 the producers of these chemicals were able to reduce their stocks in general to about one half the level of Sept. 30, 1953, and producers and mixers together reduced stocks by at least 30%. Considerable exports of some of these insecticides were made in 1954, notably dieldrin for malaria control.

Mixtures of aldrin and diesel oil were used extensively in the U.S. in the 1954 grasshopper program. Use of chlorinated hydrocarbon insecticides for the control of soil-infesting insects such as the corn rootworm and wireworms increased rapidly in the last year or two (see Table 5).

Production of both parathion and malathion increased in 1954. Domestic consumption of parathion was probably over 3,500,000 lb. in 1953. Demand for malathion exceeded expectations.

Other organic phosphorus compounds used as insecticides include some such as demeton and schradan of the systemic type. Demeton ("Systox") was approved during 1954 for a once-per-season spray for some food crops as apples, potatoes and walnuts to be applied no later than 21 days before harvest.

Lead arsenate consumption has been rather uniform at about 16,000,000 lb. annually for the last three seasons. Calcium arsenate production dropped to a new low in 1954 and producers' stocks were reduced f

6,000,000 lb. to 4,100,000 lb. by the end of the calendar year. Actual consumption in the U.S. was probably about 3,300,000 lb. in 1954.

Pyrethrum imports in 1954 included 55,000 lb. 20% extract from Kenya. One ton of average African flowers provides 120 lb. of the extract. Demand for pyrethrum is good and supplies are ample.

Imports of flowers (whole and powder) in the fourth quarter, 1954, amounted to 1,528,000 lb. It is expected that the Japanese crop will be somewhat shorter in 1955 than last year and that little will be exported because the country is a heavy domestic consumer. U.S. imports from Japan in 1954 amounted to 448,000 lb.

Rotenone was at no time in free supply during 1953-54. During the crop year imports of rotenone-bearing roots rose nearly 45% above the previous year and reports of nine manufacturers showed their combined stocks on Sept. 30, 1954, to be at least 85% higher than on the same date in 1953. Imports during the fourth quarter of 1954 amounted to 1,801,000 lb., of which 747,000 lb. were powdered. Rotenone supplies are expected to be easier in 1955.

Present supplies of ryania from Trinidad are believed ample for sugar-cane borer control in 1955.

Copper sulfate production and exports were still lower in 1954 than in 1953. As a result of hot dry weather, agricultural demand was spotty and below average until rains in early August caused sales to Maine to exceed expectations. Shipments of copper sulfate to domestic agriculture in 1954 were reported to be about 11% lower than the previous year and 33% lower than in 1952. (See Table 7, page 3.)

The quantity of mercury consumed in 1954 in agriculture (including slime control) was about 565,000 lb. Not much change in the volume of mercury compounds used in seed treatment is believed to have occurred since 1951, any increase being non-mercurial organic compounds.

End-of-season (Sept. 30) supplies of ground sulfur in manufacturers' possession each year appear to average 35 to 40 million pounds. No reliable figures are available showing present domestic consumption of pesticidal sulfur.

Drouth conditions over much of the U.S. again in 1954 kept demand for crop fungicides below average. However, the proportionate usage of such synthetic organic materials as captan, glyodin and the dithiocarbamates expanded for the replacement of older fungicides and for new uses.

Captan experienced wide acceptance, especially on fruit crops. Demand for "Karathane" (dinitro-(1-methylheptyl)-phenyl crotonate) as a control for powdery mildew of roses and some other plants increased during 1954; previously this material was known chiefly as a miticide.

Several firms have developed products containing Streptomycin for the antibiotic control of fireblight of apples and pears, bacterial blight of walnuts, bacterial leaf spot of tomatoes and peppers in plant beds, and soft rot and blackleg of cut potato tubers.

Demand for weed and bush control chemicals was good in 1954. Preemergence herbicides were popular. Over 85 million pounds of herbicidal chemicals were used in 1954 on agricultural and non-agricultural lands in the U.S.

In 1952, 31.1 million acres were sprayed for weed and brush control.

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TABLE 5
Acres Treated with Soil Insecticides in Iowa

Year	Treated with insecticide-fertilizer mixtures	Treated by other methods	Total area treated
1952	15,000 acres	10,000 acres	25,000 acres
1953	200,000 acres	125,000 acres	325,000 acres
1954	362,500 acres	237,500 acres	600,000 acres

Source: Iowa State College.

TABLE 6
Sales at Manufacturers' Level of Pesticides for Livestock Use

Type of pesticide	1940 gallons	1945 gallons	1951 gallons	1952 gallons	1953 gallons
Oil base sprays to be used without dilution	694,287	1,306,623	1,529,701	1,511,163	1,758,182
Emulsion concentrates to be diluted with water	325	60,381	208,061	125,970	119,244
	pounds	pounds	pounds	pounds	pounds
Smears	26,728	33,369	.....	.....	98,440
Wettable powders	.....	.....	1,360,408	1,246,285	3,565,801

Source: Chemical Specialties Manufacturers Assn.

TABLE 7
Copper Sulfate Shipments for Specified Uses

(In thousand pounds)

Use	1951	1952	1953	1954
Agricultural	87,920	52,232	39,744	35,200
Industrial	54,016	48,008	36.000	38,576
Other (chiefly export)	66,584	84,704	68,632	59,200
Total	208,520	184,944	144,376	132,976

Source: U.S. Bureau of Mines.

TABLE 8
Diluent Materials Used in Formulating Pesticides*

(In thousand pounds)

Year	Talc and soapstone	Pyrophyllite	Fullers' earth	Kaolin	Bentonite
1951	92,668	73,274	172,678	79,766	8,086
1952	66,610	70,162	152,232	57,890	8,146
1953	56,880	69,730	151,390	63,620	9,242

*Figures for 1954 not yet available. Source: U.S. Bureau of Mines

In the same year the combined acreage sprayed and dusted for disease and insect control was about 29 million acres, indicating an extraordinary growth of chemical weed control.

Exports of weed killers amounted to 9,823,000 lb. in 1952, 11.954,000 lb. in 1953, and 14,829,000 lb. in 1954. Figures for the particular chemicals are not available.

Nearly 14,000,000 acres of small grains and flax were treated with 2,4-D in 1953 in the area from the Mississippi River to the Pacific Coast. California, Oregon and Washington have established certain areas where application of 2,4-D and related chemicals is restricted during the growing season. This has resulted in some shift to low-volatile formulations.

Production of 2,4,5-T (acid basis) in 1954 was only 51.6% of the 1953 production. However, in the two months, December, 1954, and January, 1955, production amounted to 751,000 lb.

An industry survey at the formulators' level shows sales of chloro-IPC to have been 360.000 lb. in 1953 and 470,000 lb. in 1954. Ample stocks appear to be available for 1955 requirements. About 300,000 acres of cotton in the mid-South were treated with this chemical in 1954.

Inventories of eight organic herbicides were reported in the recent survey by the Commodity Stabilization Service, including several not listed in Table 3. On the basis of these figures, stocks of these chemicals averaged 6.6% lower at the end of the 1954 season than at the same time in 1953.

The area of cotton defoliated chemically in 1953 is believed to have been about 3.500 000 acres. No comparable figure for 1954 is yet available.

Calcium cyanide sold well as a grain fumigant in 1954. Methyl bromide is in growing use as a fumigant of stored products and of seedbed soil. A substantial quantity is exported to Brazil.

Soil fumigants are increasingly employed for nematode control. The size of the market is variously estimated at from $5 to $8 million. Two principal chemicals in this field are ethylene dibromide and "D-D Mixture."

It is reported that about 90,000 acres of seed beds and fields were treated with "D-D" in 1954 and about twice that area with ethylene dibromide. About 1.8 to 2 million pounds of methyl bromide also were applied to soil, mostly to tobacco, celery and other seed beds. A less quantity of chloropicrin was used chiefly in greenhouse soils.

The quantities of principal diluent materials used in formulating dry pesticides were similar in 1953 to those consumed in 1952 (see Table 8, page 3).

Recently it was estimated that about 50% of the DDT used in the U.S. is in wettable powders, 25% in emulsifiable concentrates and the remainder in dusts, while 80% of the benzene hexachloride is in dusts, 15% in wettable powders and 5% emulsifiable. Probably about 80% of the toxaphene is sold in the form of emulsifiable concentrates.

One group of emulsifier producers estimates that farm chemicals will consume in 1955 about 10 million pounds of emulsifiers, largely in liquid concentrates of insecticides and herbicides. Other estimates range from 8 to 12 million pounds.

In 1951 about 6 million pounds of emulsifiers are believed to have been employed in this manner. About 90% of the emulsifiers now used in formulating pesticides fall in five chemical groups: (1) sorbitol and certain other polyols (especially glycols); (2) ethylene oxide; (3) long-chain phenols; (4) fatty acids (principally oleic and stearic); and (5) sulfonated oils.

Several million pounds of surface active agents are employed annually in the manufacture of wettable powders. The magnitude of this business can be seen by the single fact that DDT exports are in the form of 75% wettable powder containing 2 to 6% of a wetting agent. Large quantities of many kinds of wettable powders are manufactured for domestic use also.

Farmer Campaign Results in New Experiment Station

ARTESIA, N.M.—The Pecos River Valley is getting its own experiment station, largely because of the efforts of a few dozen farmers. Other stations in New Mexico have done excellent work, but the Pecos Valley has problems peculiar to its own region and farmers believe that a station at home would be of more help to them.

A year ago they got together, raised $60,000 through their newly organized Pecos Valley Farm Planning Assn., bought 160 acres of land, and talked New Mexico A&M College into using it for an experiment station. After that the state legislature appropriated $82,500 a year for its first two years of operation.

Recently the land was cleared of mesquite, and work on the physical plant will begin about July 1. New Mexico A&M College will have complete charge of the work; however, businessmen of the town will probably be called upon to help out in getting sufficient equipment and seed to get the station work started.

According to Walter Stroup, farmer and member of the association, studies will be made on such things as water and how it can be conserved and made to produce more, improvement of major crops, studies on insects and how to control them, and several other problems which may be holding down production in the Pecos Valley.

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NATURE and PREVENTION of PLANT DISEASES
By K. STARR CHESTER, Ph.D.— Stresses the practical aspects of plant disease control. Presents the essential features of plant pathology as exemplified in the leading diseases of important American crops. Extensive revisions of seed treatment, and spraying and dusting of fruits and vegetables are included. The latest developments in control practices, including the slurry, pelleting and vapor-heat methods of seed treatment, new non-metallic organic fungicides, innovations in methods of spraying and dusting are discussed.
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INSECT, PLANT DISEASE NOTES

Pea Aphid Damage Reported in Virginia

BLACKSBURG, VA.—Severe damage to alfalfa fields throughout Virginia from the pea aphid is reported by Arthur P. Morris, associate entomologist at VPI, who says this pest is teaming up with such insects as the alfalfa weevil and clover leaf weevil to make heavy inroads on the state's alfalfa plantings.

Stands have been reduced and growth delayed or stopped. The alfalfa crop suffered from the late freeze and in many cases plant diseases have further complicated the problem.

Trouble from the green June beetle larvae is expected in tobacco beds where there is a lot of organic material. Blue mold has been reported in North Carolina and along the border in Virginia. Seed corn maggots are beginning to destroy bean, pea, and corn seed and seedlings.

Forest and shade trees are in for annual trouble, too. Reported in the last week have been elm leaf beetle, eastern tent caterpillars, and pine sawfly larvae.

Variety of Pests Marks Illinois Report

URBANA, ILL.—Clover leaf weevil hatching is now complete; therefore, populations will not increase. Warm temperatures of a week ago favored development of a fungus disease that caused many worms to turn brown and die. During this past week, however, cooler temperatures retarded progress of the fungus and plant growth.

In occasional forage crop fields in eastern and northern Illinois, spittlebug nymphs are numerous enough to warrant insecticide applications. Treat only those fields in which the population averages at least one per stem. Use BHC, methoxychlor, or toxaphene.

Pea aphids are still scarce in fields of clover and alfalfa examined this week. In northern Illinois, however, a few fields of alfalfa have light infestations.

Armyworm moth flight has been moderate to heavy in eastern Illinois, and occasional moths have been seen in the northern part. An outbreak of armyworms has been reported from the extreme southern section. This does not necessarily mean that outbreaks will occur generally. At present there is no cause for alarm.

In eastern and central Illinois flights of chinch bugs from winter quarters have begun. Although the overwintering adults have not yet become established, observe weak, thin stands of small grains for signs of damage within the next few weeks.

The corn borer apparently survived the winter very successfully, and we are faced with what may develop into a serious infestation in the northern half of Illinois. However, above normal temperatures of the past two weeks have accelerated borer development. If these higher temperatures continue, moth flight may occur earlier than usual.—Geo. C. Decker.

Hay Crop Affected By Pests in Maryland

COLLEGE PARK, MD.—Alfalfa weevil infestations seem to be moderately heavy in most sections, with severe damage in spots. Overwintered adults are still moving about in the fields, hence there are likely to be more larvae and more damage. Adults and small larvae were found in different sections of Frederick County (11 farms visited) and also a few in Washington County.

Pea aphid is generally diminishing on alfalfa, though still in injurious numbers in spots, particularly in the western part of the state. Spittlebug is light on the Eastern Shore and in the vicinity of College Park, but rather heavy in Frederick and Washington counties. Green worms were found on alfalfa in Baltimore County.

Flea beetles have been reported on potatoes on the lower Eastern Shore and cutworms have been reported on early tomatoes on sod land near Salisbury. Cutworms are also present at College Park in sod, and will give trouble in flower and vegetable gardens.

Euonymus scale will be hatching soon and boxwood leafminers are due. Ticks are on the move and will be encountered in high grass or brush.—Theo. L. Bissell and Wallace C. Haring.

Cutworms, Soil Pests Featured in Missouri

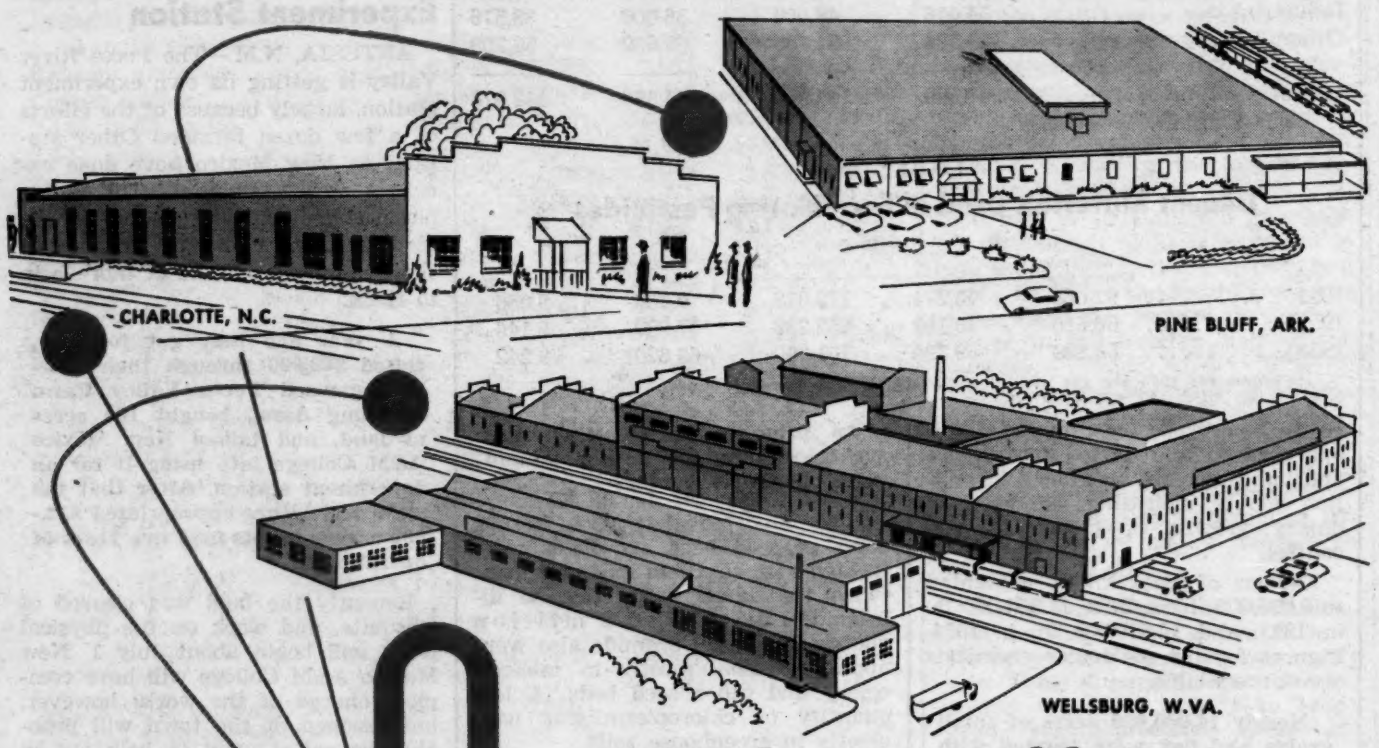
COLUMBIA, MO.—At the present time, cutworms continue to be the most immediate threat. It still looks as though the first heavy damage from these worms will come on seedling corn, although we have already taken considerable loss on some legume and pasture crops.

Beans and sweet corn in the garden, as well as some untreated field corn, have been worked heavily by seed corn maggots. These are small white, fly maggots that eat away the germ of the seed. As early as seed field corn is going in, it is almost a must to use a seed treatment on corn planted on land not treated with a soil insecticide.

Armyworm moth flights have continued during the week, and a few small worms are beginning to show up here and there. As yet there is no way of knowing for sure what to expect in armyworm numbers, but we should begin to get some indication within a week or so. The moth flights have been heavy enough that it's hard to see how we could escape with some damage.

In the southwestern part of the state, a sod webworm has migrated out of weedy fence rows and moved into oats. Where this has occurred damage has been very heavy. Spray with 2 lb. toxaphene per acre for control.

Cinch bugs are out of hibernation and have moved into small grain. Few eggs have been laid yet, but will be only a short time until egg laying starts in the southern half of the state. Hornflies are building



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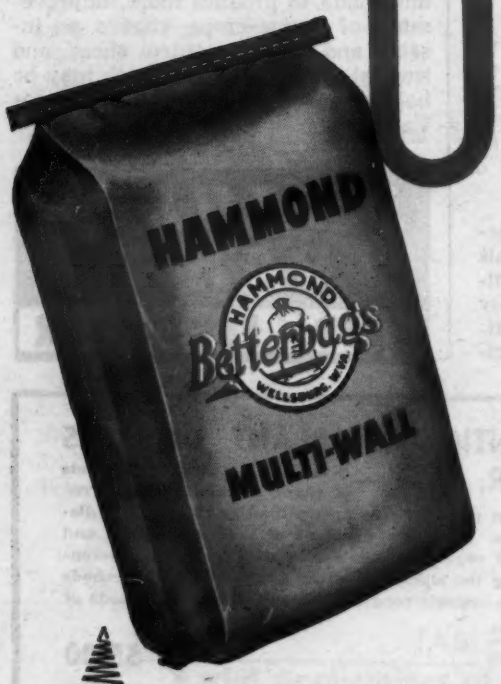

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pidly. It's time to get those back-bbers up and into operation. Charge em with 5% DDT, or 5% toxa-ene, in oil.

In the Ozark area, ticks are out in rce, and a lot of cattle are becom-g heavily infested. On those beef ttle that can be rounded up, spray dip with 0.5% toxaphene (made om an emulsifiable concentration epared especially for use on live-ock), or with a mixture of 0.015% mma BHC and 0.5% DDT.—Stir-ng Kyd and George W. Thomas.

outh Carolina Says festations Present

CLEMSON, S.C.—Highlights of the eekly report prepared by specialists the Clemson Entomology and Plant isease Extension work said that eavy infestation of vegetable weevils ere feeding on tobacco in Horry unty; rough-headed cornstalk etle was damaging corn in Sumter unty; and the clover head weevil ot to be mistaken for the alfalfa eevil) was infesting alfalfa in New-rry.

Housefly infestations are on the in-ease, termite swarms continue and bbage caterpillar infestations in the arleston area are high enough to stify control measures. The same is ue of the potato beetle, also in the arleston area.

orn and Cotton Pests eported in Florida

GAINESVILLE, FLA.—Corn earworm was infesting sweet corn at ero Beach and some armyworms ere noted in ears infested with corn rworms. Armyworms were also eding in considerable numbers on ra and Pangola grasses at the Ever-ades Experiment Station.

The lesser cornstalk borer, fairly igh in population, was infesting ut grass at the Everglades Ex-eriment Station. Adjacent young orn that was given pre-emergent secticide treatment and a sub-equent treatment did not become fested. Populations in some young gar cane plantings were very eavy. Some fields had 50% or more shoots showing dead hearts in-icative of larval activity.

Fall armyworm was causing spotty festations on corn in the Everglades ea, and the lesser cornstalk borer s infesting butter beans in Her-ndo County.

Boll weevil, averaging one adult young boll, was infesting com-rcial cotton at Vero Beach.—H. A. nmark.

rasshopper, Other sects Hit Kansas

MANHATTAN, KANSAS — Grass-pper infestations, range species, building up to threatening pro-rtions in pastures of the Cimarron er Valley in southern Clark Coun-southwest Kansas. The spring ch had not become noticeable in central and northern part of rk County.

Non-economic infestations of Eng-h grain aphids were found in the lowing twelve counties of central d northern Kansas: Clay, Dickin-, Geary, Jackson, Marshall, Mor-, Nemaha, Pottawatomie, Riley, awnee, Wabaunsee, and Washing-. Insignificant numbers of green-gs were found in one field of wheat southern Marshall County.

Pea aphids are beginning to in-rease in numbers in central and rthern Kansas; however, infesta-ns are still considered to be light. owever, pea aphid populations ve increased to such a degree in veral localized areas of south-stern Kansas that insecticidal ntrol measures are required.

Grasshoppers (Melanoplus spp.) can be found in most of the fields of nsas. The spring hatch is progress-and numbers of grasshoppers are increasing as predicted from surveys that were made last fall. Newly hatched nymphs were found in nearly all fields that were surveyed in twelve counties of central and northern Kansas. Eggs of M. differentialis and others that appeared to be M. bivittatus are still being found, indicating that the hatch of these species hasn't begun.

False wireworm larvae were found in Dickinson County in wheat fields and in fields being prepared for corn plantings. A few of the larvae have begun to pupate and nearly all of the larvae that were collected appeared fully developed and ready for pupation.

Light infestations of clover leaf weevils were found in red clover fields of Jackson and Nemaha counties, northeast Kansas. Minor larval feeding damage to the plants was observed. Clover root curculio infestations were found in nearly all alfalfa fields that were surveyed in central and northern Kansas.

Armyworm moths were observed in fields of barley and wheat in central Kansas counties. Flights of moths around lights at night ranged from light to moderate in intensity. No spring generation larvae were found in the following counties: Clay, Dickinson, Geary, Jackson, Marshall, Morris, Nemaha, Pottawatomie, Riley, Shawnee, Wabaunsee, and Washington.—David L. Matthew, Jr.

Corn Insects Getting Under Way in Iowa

AMES, IOWA—European corn borer overwintered larvae are preparing for pupation rapidly. First emergence should occur about May 12-15. Attractive corn will be very scarce. We still recommend planting when the ground is ready, with a full stand and optimum fertilization. Tall, vigorously-growing, early corn will need protection from first brood.

Seed corn beetles are abundant. If farmers are not using a broadcast soil treatment or are using starter fertilizer - insecticide band treatment, a seed treatment will be profitable.

Granulated and other cutworms are reported in alfalfa from Scott County. Numbers range from 2-6 half-grown larvae per square foot. Where damage is severe, spray only the damaged areas with 2 lb. toxaphene an acre.

Half grown spring cankerworms are abundant on plum and apple in southern Iowa and mites on fruit trees and ornamentals are hatching. The more you kill now the fewer you will have later.—Harold Gunderson.

Georgia Reports Armyworm Damage

ATHENS, GA.—Severe damage to oats by the true armyworm (not the fall armyworm) has been reported from Sumter and Houston counties. Some fields had been almost completely destroyed before the damage was noticed. Farmers should be warned to be on the lookout for this pest. While the true armyworm pre-

(Continued on page 21)

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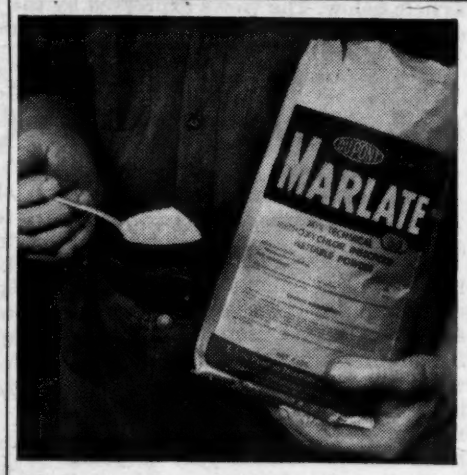

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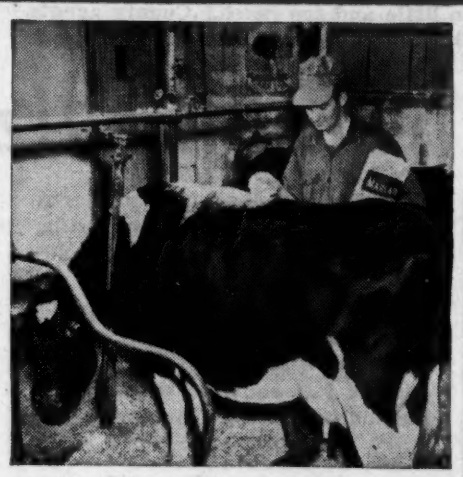

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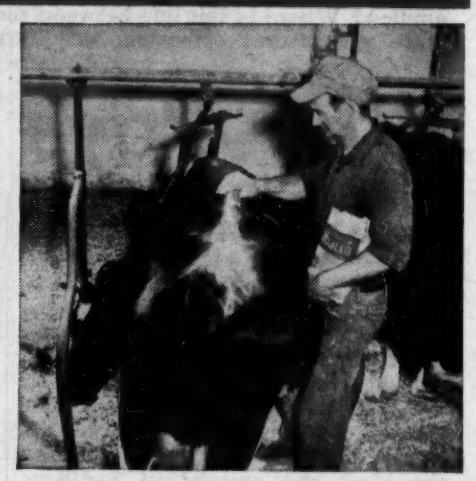

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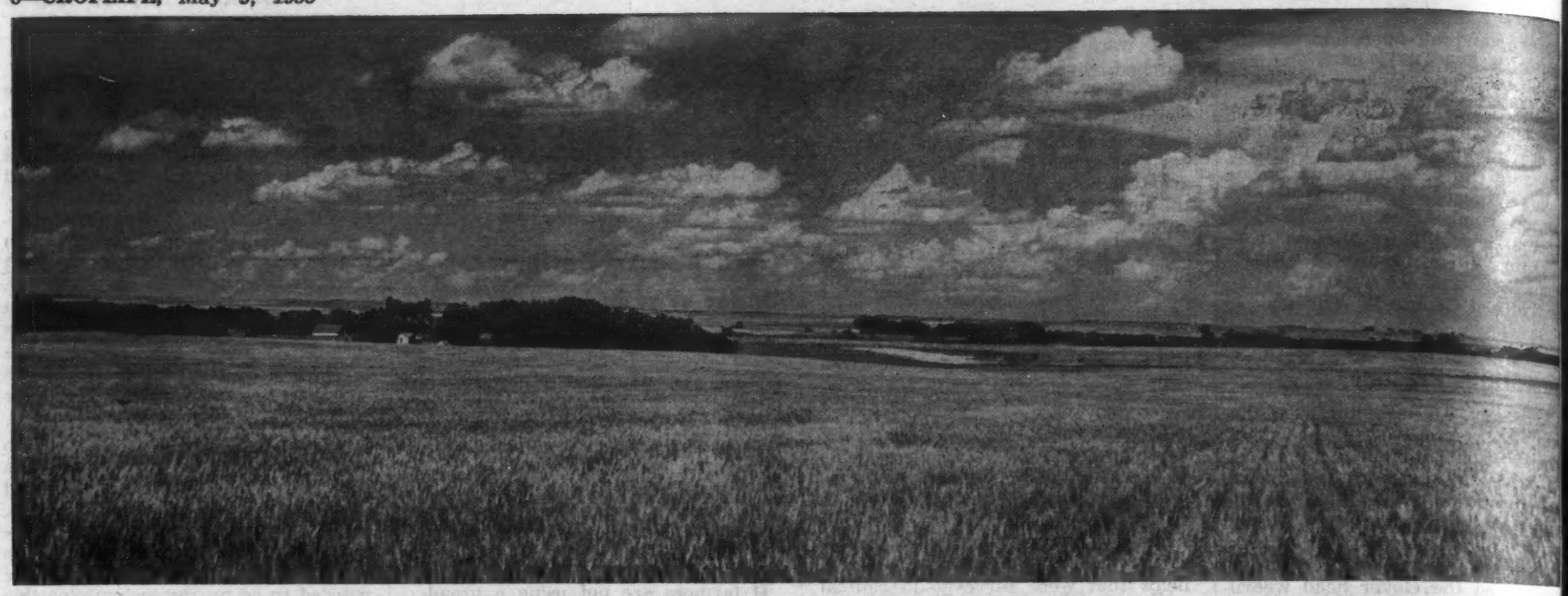

WHO PAYS FOR FERTILIZER—With some 42% of U.S. farms operated by tenants and part owners and these farms accounting for some 55% value of farm products, the problem of who should buy fertilizer for these acres concerns fertilizer manufacturers and dealers alike. Reluctance of the tenant to buy may stem from lack of information as to how much and what kind should be applied for optimum crop yield during the current season. What are the responsibilities of both owners and renters? Should landowner and tenant share in fertilizer costs, or should the tenant determine how much can be applied? Where is the line between too little and too much? County agents, state agricultural extension, the USDA and other agencies have all contributed greatly in dissemination of information of this type. Still, the last person to talk to the fertilizer purchaser, is the dealer. It is therefore important that dealers should be armed with answers to questions asked when the tenant comes in to purchase his year's plant food requirements. The purchaser is eager to get maximum yield from his crops, yet, he may feel that he can't afford to do so if he pays a larger share of the costs than he gets back in benefits. Some of the factors involved in this matter have been evaluated by Virgil L. Hurlburt, USDA collaborator, whose findings are contained in the article below. The views expressed by the author are his own and do not necessarily represent those of the U.S. Department of Agriculture.

Who Pays for Fertilizer on Leased Lands?

By VIRGIL L. HURLBURT

Production Economics Research Branch
U.S. Department of Agriculture
Iowa State College, Ames, Iowa

Just how much fertilizer to use is a decision admittedly difficult to make accurately. There are numerous variable factors involved, including the kind of crop, the soil type, rainfall and temperature, as well as the timing and method of application and the kind and amount of fertilizer used.

Whether the purchaser of fertilizer is an owner or a tenant, the technical problems about yield response and economic considerations are the same. However, when the tenant comes to purchase his fertilizer, he has additional factors to consider, arising from the leasing itself. These may influence decisions on the kinds, amounts and use of plant foods.

He must consider that: 1) costs may not be shared the same as returns are shared; 2) the short period of the lease, usually one year, may discourage any practices from which a benefit extends into another year; and 3) the final decision must be made by two parties . . . the landlord and the tenant.

A few illustrations will demonstrate how these conditions within a lease may influence practice in the use of fertilizer. Although the illustration for yield response is taken from experimental, rather than from actual farming data, and the results applied only to the soil type studied and the kinds of fertilizer used, the same type of analysis will still apply to other situations because the same types of problems are involved. Only the details differ.

The purpose of the illustration is to demonstrate the possibility that cost-sharing arrangements within the lease may encourage or discourage the use of fertilizer, depending on content of the lease and the nature of the agreement between landlord and tenant.

All operators need to know something about yield response to decide how much fertilizer to apply per acre. It is not enough to know that in general, an application of 200 lb. will increase yields about 20%, on the average. If fertilizer is to be used effectively, the operator must know something about the yield response from different rates of application. Specifically, he needs to know how much additional yield to expect from additional application, since profit from use of fertilizer is greatest when the cost of the last unit applied is just equal to the value of the additional crop it produces.

Lack of specific information about yield response for different farming, soil and climatic conditions undoubtedly explains many practices in present use of fertilizer. Particularly, it would help to explain nonuse, as well as the tendency toward rather standardized rates of application over whole farms and in farming areas.

But, organized research and farmer experience are slowly obtaining more specific information, such as the results from nitrogen and phosphate in producing corn shown in table 1.

If the data in Table 1 were the basis for operator decision, he would apply 320 lb. fertilizer—that is, go to the fourth input of 80 lb. an acre. Because with that unit, the value of the additional corn approximates the cost of the additional fertilizer. On the fifth input, the cost of the additional fertilizer exceeds the value of the additional corn.

This would be the situation for an owner-operator, for a cash renter, and for any leasing arrangement in which the share of the crop is the same as the share of fertilizer costs. As may be seen, the relations between cost of fertilizer and value of corn, for any of the inputs (i.e. any line across the table) remain the same when both cost and return are divided by the same number. For example, the ratio of 13.30 to 12 is the same as the ratio when each is divided by 2, by 3 or by any other number.

In this example, costs of spreading fertilizer would be practically the same, whether 40 or 240 lb. were used. Spreading costs would increase if there were two separate applications, for instance, by applying liquid nitrogen at the time of the final cultivation. For the present purpose, one can also overlook cost of harvesting the higher yields of corn. The main comparison in Tables 1 and 2 is between added fertilizer cost and added corn value.

Now, assume that a share lease is involved. The effect of four different arrangements concerning share of fertilizer cost is illustrated in Table 2 using the same yield and value data as in Table 1. The share of the crop is assumed as 50-50, and for this illustration it is also assumed that the lease continues from year to year.

The 50-50 share of corn is for illustration only. Any other division such as ⅓-⅔ or ¼-¾ would serve as well. Determining the crop share is a problem in itself, in any and each share lease.

In this illustration, if all fertilizer costs are paid by the tenant, clearly it does not pay him to apply more than 160 lb. Thus, compared with an owner-operator, or with a 50-50 sharing of fertilizer costs, the rate of fertilizer application is decreased. Likewise, if the tenant pays 75% of the cost, the third unit application (total of 240 per acre) is profitable to him; and if he pays ¼ of the fertilizer, an application of 480 lb. is then profitable.

These data also illustrate the importance of the question of who makes the decision about rate of application. If the tenant decides, and share of cost differs from share of return, then on the basis of profit to him he may limit or increase the rate of application.

If the landlord pays all fertilizer costs and the tenant decides how much to apply, it is to the tenant's benefit to apply more. In the example, it is to his benefit to apply 640 lb., even though the total additional corn value at the 400 lb. application is less than the additional cost of fertilizer —because his share of the value of additional corn exceeds his share of cost of the fertilizer.

In general, any share of fertilizer cost differing from share of the crop creates an economic incentive for the party making the decision to change the rate of application from what it would otherwise be. If the share of cost is larger, there is reason to decrease the rate, or if the share of return is larger, to increase the rate of application.

If a clause or agreement in the lease specifies the rate of application, one or the other party may benefit at the expense of the other, when share of crop differs from share of fertilizer cost. For example, if the lease required that 240 lb. fertilizer be applied, with the tenant paying all fertilizer cost, the landlord would benefit at the tenant's expense because the cost of the third unit of fertilizer exceeds the value of the tenant's share of corn.

In many leases, there are compensating adjustments or cost balancing plans which counteract the effect of difference between share of fertilizer cost and share of crop. For example, the tenant may agree to pay all fertilizer costs, to match some other approximately equal variable cost paid by the landlord.

If these compensating arrangements encourage the same application of fertilizer as would any plan in which share of cost is the same as share of return, no harm is done. But, if any fixed cost is balanced against a variable such as fertilizer, there is reason for the party paying the variable to stop at the point where total cost of fertilizer equals that fixed cost. This may not result in the most effective use of fertilizer.

Under the usual form of cash lease, in which cash is the only rental paid, the tenant pays all variable costs and gets all crops. He therefore has reason to apply fertilizer until the final unit of application equals the value of the additional yield. In general, the cash tenant will have the same incentive and use the same amount of fertilizer as if he were an owner-operator. About the only exception would be the one-year, non-renewable lease, or the case in which the cash rental is thought exorbitant.

So far, only the current effects of use of fertilizer have been considered. In addition, there is a carry-over value and a cumulative effect. In short, after high rates of application on low productivity soils for a number of years, the rate of application can be decreased without decreasing yield response.

In the experiment cited above there was a second year effect of about 25%. The effect on yields the second year varied with the rate of application the first year, with a slightly larger carry-over in the higher rates of application.

But use of the average of 25% will suffice to illustrate the significance of carry-over here. (The reader is cautioned again that carry-over var

with type of soil and the like, the same as do first year effects. And this example of 25% cannot be generalized to other conditions. Rather, the point is to look at the carry-over value problem as related to leasing, by using the 25% example.)

There is no problem involved if the tenant stays on the farm a number of years. Then he receives the benefit of carry-over the same as of first year benefits—until the year the lease terminates.

If a quarter of the yield benefits from fertilizer applied in the current year are realized in the following crop year, what type of cost sharing or compensation arrangement will it take to encourage full use of fertilizer? One answer is for the two parties to agree, in advance, and as a part of the lease, as to amount of payment for carry-over value.

Suppose, for example, that 320 lb. have been applied, and the share is ½ for both crop and cost. The tenant's total cost for fertilizer bought is $24 per acre (see Table 2). Using the 25% carry-over, a payment to him of $6.00 an acre when the lease ends, approximates the fertilizer cost on which he has not received a return.

Some further adjustment in the carry-over percentage itself might be made to take care of the tenant's costs of hauling and spreading. But the main point here is return on fertilizer cost alone—since that can be a sizeable dollar figure per acre, under high rates of application.

Likewise, if the tenant paid all fertilizer cost, and there were no compensating arrangement or other cost balancing, he would need to receive a payment of $6.00 per acre when the lease ends, to cover his outlay (¾ of $24.00, since he supposedly drops back to the 160 lb. rate).

Similar illustrations for other shares, of costs and returns, would work out the same way. In each case, the method would be to pay the tenant an amount equal to the carry-over per cent multiplied by his total fertilizer cost for the year applied. This would hold for the cash lease, too, for in it the tenant pays all fertilizer cost. Obviously, if the rental agreement specifies that the landlord pays all fertilizer costs, no compensation payment to the tenant is needed when the lease ends.

The above illustration is for one crop. Application to a rotation is more complicated. Yield response must be known for all crops, to determine the annual application. Carry-over effect varies among crops. But the same principles of cost sharing hold—with one important further principle. Namely, the shares of all crops should be the same. Otherwise, the tenant and landlord will experience difficulty in making effective use of fertilizer throughout the rotation.

If the shares of crops differ, there is a complicated problem in determining the rotation. There will be a tendency, or at least an incentive, to increase the acreage of the crop with the lower rental share. The result will usually be a lower income from the farming operations than if the shares were the same.

In other words, different crop shares provide incentive for the operator to move away from the highest profit combination for the farm. The income effect from that shift in combination of enterprises might be greater than the effect of applying too little or too much fertilizer.

Common in the state of Iowa, and in other areas as well, are crop-share leases in which the share of corn is ½, of oats ⅔, and of soybeans ⅔, with a cash rental on hay and pasture. These rental terms, plus the fact that share of cost frequently differs from share of return, and that there is often uncertainty as to renewal of the lease, are sufficient reasons to retard use of fertilizer on rented land.

Experimental evidence and economic analysis indicate that investment in additional fertilizer is one of the more important opportunities available now and in the future to increase net farm income. As population and the demand for food and fiber increase in the years ahead, more production will need to come from land now in farms, whether owner or tenant operated. This will require use of more fertilizer.

It may also require that changes be made in leasing arrangements, so that the terms of the lease as such do not retard or prevent efficiency in farming operations.

Table 1

Costs and returns under different rates of applying fertilizer.*

No. lb. fert. acre	Yield corn per acre bu.	Additional corn from additional fertilizer bu.	Value of additional corn @ $1.40 bu. dollars	Additional fertilizer per acre lb.	Cost additional fert. dollars	Total cost fert. dollars
0	5.7	..	..	..	..	..
80	72.6	66.9	93.66	80	12	12
160	95.9	23.3	32.62	80	12	24
240	110.1	14.2	19.88	80	12	36
320	119.6	9.5	**13.30	80	**12	48
400	126.1	6.5	9.10	80	12	60
480	130.4	4.3	6.02	80	12	72
560	133.2	2.8	3.92	80	12	84
640	134.7	1.5	2.10	80	12	96

*Data on yield response taken from E. O. Heady and J. Pesek, A Fertilizer Production Surface With Specification of Economic Optima for Corn Grown on Calcareous Ida Silt Loam, Journal Farm Economics Vol. XXXVI, No. 3, August 1954.

**Most profitable rate of application because additional value approximates additional cost.

Fertilizer cost calculated at 12¢ lb. for phosphate and 18¢ lb. for nitrogen.

Table 2

Value of additional corn and cost of fertilizer to tenant, under different rates and shares of cost.

No. lb. fert. per acre	Value additional corn	Cost of additional fertilizer when tenant's share of fertilizer cost is				
		100%	75%	50%	25%	none
80	$46.83	$12	$9	$6	$3	$0
160	16.31	**12	9	6	3	0
240	9.94	12	**9	6	3	0
320	6.65	12	9	**6	3	0
400	4.55	12	9	6	3	0
480	3.01	12	9	6	**3	0
560	1.96	12	9	6	3	0
640	1.05	12	9	6	3	**0

**Most profit rate of application, for tenant, under given share of cost.

Olin Mathieson Denies Overcharge in Arkansas Lawsuit

LITTLE ROCK — The Arkansas Plant Food Co., North Little Rock, has filed a $228,000 damage suit in U.S. District Court here, charging the Mathieson Chemical Co. and the Olin Mathieson Chemical Corp., also of North Little Rock, with violating anti-trust laws. The two Mathieson firms are charged with raising the price of superphosphate between 1950 and 1954 to the Arkansas Plant Food Co., but allegedly not to other customers.

The suit declares that the Mathieson organization is the only available source of superphosphate in Arkansas, and claims that the firm overcharged $1 per ton on 76,178 tons of chemicals bought by the Arkansas Plant Food Co. during the years named in the suit.

The Arkansas Plant Food Co. seeks triple damages for the alleged violation of anti-trust laws.

Sam L. Nevins, Olin Mathieson vice president at Little Rock, told Croplife in a telephone interview, that "there is absolutely no foundation for such charges." He said that "In no case did we charge them one red cent more for superphosphate, than was charged any other customer."

Mr. Nevins said further that the plaintiff's statement to the effect that no other source of superphosphate was available in Arkansas, is "ridiculous." He pointed out that there are sources at Walnut Ridge and Texarkana, Ark., and at Memphis, Tenn., located on the eastern border of Arkansas. Other plants close by, mentioned by Mr. Nevins, are located at Joplin, Mo., Muskogee, Okla. and Shreveport, La. "We are practically surrounded by superphosphate sources," he commented.

ASC APPOINTMENT

WASHINGTON — Ezra Taft Benson, secretary of agriculture, has announced the appointment of Rodney K. McCammon of Mankato as a member of the Kansas State Agricultural Stabilization and Conservation Committee. Mr. McCammon succeeds Emmett Womer of Smith Center, who resigned recently.

Ray I. Mitchell

SALES MANAGER — Promotion of Ray I. Mitchell to the position of sales manager of Vulcan Steel Container Co., Birmingham, Ala., has been announced by Gordon D. Zuck, company president. Mr. Mitchell joined this company in 1953. He is a graduate of the University of Alabama. He served in the Navy in World War II, and spent several years in industrial sales work. His headquarters will be at the company's main office and plant in Birmingham.

Wayne D. Wegrich

Wayne D. Wegrich To Manage Diamond Black Leaf Plant

CLEVELAND — Appointment of Wayne D. Wegrich as manager of the Waco, Texas, plant of Diamond Black Leaf Co. was announced here May 3 by George V. Dupont, manager of manufacturing for the firm.

Mr. Wegrich comes to the Diamond Black Leaf organization from Minnesota Mining & Manufacturing Co., where he has been a sales engineer for nearly a year.

From 1952 to 1954, he was connected with the Virginia-Carolina Chemical Corp. in various supervisory capacities at its Waco and Richmond (Va.) plants. A native of Indiana, born in Terre Haute, Mr. Wegrich was graduated in 1952 with a B.A. degree from Baylor University, Waco.

May Research Conference Set for Western Workers

PULLMAN, WASH.—A three-day research conference to aid farmers in the 11 western states to do a better job both of marketing their products and purchasing supplies, will be held at Washington State College here, May 9-11. The sessions will be attended by college research workers, representatives of the U.S. Department of Agriculture, cooperative leaders, farmers and bankers.

Jointly sponsored by the American Institute of Cooperation, national research and educational agency of farmer cooperatives, and the Farmer Cooperative Service, USDA, the regional conference is the first of its kind, J. K. Stern, president of the institute said. Research workers from Washington, Oregon, California, Montana, Wyoming, Utah, Idaho, Colorado, Nevada, Arizona and New Mexico are expected to be present.

1954 Kentucky Sales Total 580,410 Tons

LEXINGTON, KY. — Fertilizer sales in Kentucky during 1954 totaled 580,410 tons, according to the state Department of Feed and Fertilizer. This includes 459,440 tons of mixed fertilizer and 120,970 tons of straight materials and miscellaneous products.

Leading grades were 3-12-12 with 68,566 tons and 5-10-15 with 68,436 tons. The report shows that the average analysis of mixed fertilizer in 1954 was 4.2-10.9-10.5, compared with 3.9-10.7-9.6 in 1953.

BUYS BUSINESS

HEDRICK, IOWA—Sam Singmaster of Keota, Iowa, has purchased the seed and fertilizer business here from Albert and Glen Bakehouse.

PESTICIDE MEETING

(Continued from page 1)

and budget. He said that his department has not been able to devote any research work to many areas in the field of entomology, citing work on insect pests that attack man and animals, stored grain insect pests, forest insects, forage crop insects and structural insects, such as termites. The program of the department of entomology currently deals with cotton, tobacco and peanuts, he said.

In a review of the insect control practices on the various staple crops in North Carolina, Dr. Smith said that for the tobacco crop, "about as much is being used now as is needed," with about 90% of the tobacco growers using pesticides correctly. He urged formulators to help the entomologists in their educational campaign on the use of toxaphene.

For cotton, he said that some materials are being misused and an insect population survey "would help tremendously" in preventing serious outbreaks of cotton insect pests. He predicted an increase of from two- to four-fold in the use of insecticides on cotton in the next 10 years.

Dr. Smith said that there probably would be an increase of ten-fold in the use of soil insecticides in peanut production during the coming 10 years. He also predicted a "much greater use" of soil insecticides in North Carolina.

The afternoon of May 3 was given over to a conducted tour of the research laboratories of the entomology department on the North Carolina State College campus. Dr. R. T. Gast of the departmental staff, told the visitors of his work with insect toxicology; Dr. J. M. Sasser showed them some of the work being done in nematology, and Dr. E. W. Constable, state chemist, gave the formulators a trip through the analytical laboratories.

The program for May 3 concluded with a cocktail hour, dinner and entertainment.

W. R. Peele, of the W. R. Peele Company, Raleigh, president of the association, presided at the meetings.

Dr. Constable, state chemist, was a speaker on the program May 4 and in his address, told formulators that the state's insecticide laws "were put into operation with a minimum of difficulty." He thanked the pesticide formulators for their understanding and cooperation.

He pointed out that the pesticide laws and regulations were designed to protect the manufacturer or formulator as well as the buyer and added that "some sort of rules of the game must be observed."

In his address he reviewed the development of the state's insecticide laws and said that the successful administration of the regulations is "a sort of co-defendant arrangement between manufacturer, dealer and buyer." He predicted that the pesticide formulating industry "is on its way to becoming a bigger and better industry."

G. Wesley Williams, executive secretary of the Raleigh Merchants Bureau was the concluding speaker on the program. The official gave the members of the newly organized association considerable advice on the operation and functions of a trade association.

He told them, for example, that they could raise the level of the industry by cooperation in fighting together to make it possible to conduct their businesses with a minimum of government interference; that they would be able to do things together that they could not do alone; that they could profit by an interchange of information and ideas; and that they could protect and enhance their interests.

He advised against indiscriminate price-cutting and urged them to build their businesses on quality of their products and on quality of their services.

The meeting was attended by approximately 75 pesticide formulators from the three-state area and a scattering of associate members.

The next meeting will be held in October at a time and place to be announced later.

when you bag in

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Insect Activity Noted in Mid-South

MEMPHIS—Cotton planting is well under way throughout Mississippi, but farm lands in West Tennessee still are too soft and wet for much plowing, according to Extension Service specialists.

Much of the earlier planted cotton in Mississippi is up to a stand and farmers are poisoning for thrips control.

Armyworms are showing up in small grain fields throughout Mississippi, reported A. G. Bennett, extension entomologist. He advised poisoning immediately when five to seven worms a half-inch long or longer are found per square foot.

Home gardens continued to recover from freeze and rain damage, according to K. H. Buckley, associate extension horticulturist. He added that all warm vegetables are now being planted, including the setting of egg plant, pepper and tomato plants.

Cabbage is moving to market in limited amounts from the Crystal Springs area, said Chesley Hines, extension horticulturist. Volume movement should begin within 10 days, he added.

Judd Brooks, district agent at Jackson, Tenn., said farmers need a week of warm, dry weather to give them a chance to get crops planted.

"Farmers are about a week behind schedule with their field work," he said.

The spring season with its unusually high rain record has been very beneficial to pastures, small grain and strawberries, the district agent said.

Gardens are somewhat late but are making good growth. Upland corn has been planted and cotton planting should get under way soon.

New Mexico Shipments

STATE COLLEGE, N.M.—Fertilizerer shipments in New Mexico during the first quarter of 1955 totaled 16,212 tons, according to the state Feed and Fertilizer Control Office. The total includes 4,209 tons of 45% superphosphate and 3,954 tons of 20% superphosphate.

Special Retail Section

Better Selling

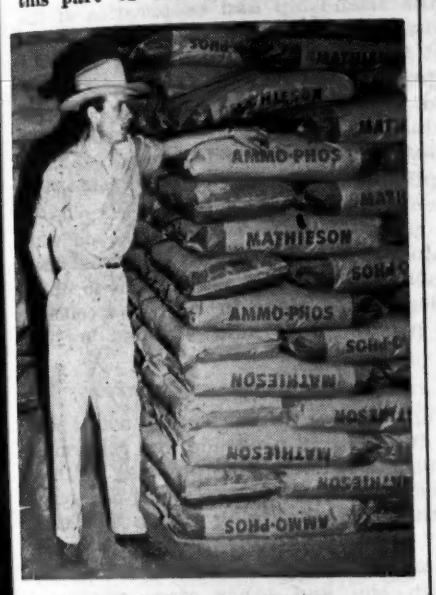
Richer Fields for Dealers

A SPECIAL CROPLIFE DEPARTMENT TO HELP RETAILERS IMPROVE MERCHANDISING KNOW-HOW

Custom Spreading, Product Knowledge Open Door to Sales for Texas Firm

Working with farmers out in the fields has been the doorway to bigger sales for the Farmer's Corner of Lubbock, Texas. Formerly the owners, Dan and R. C. Young, sold nothing but feed and similar supplies. But when West Texas turned to irrigation, they saw a golden opportunity in farm chemicals.

Starting out with a small stock of fertilizer and insecticides three or four years ago, they have seen this part of the business expand until it now equals the feed and seed business in volume.



TEXAS DEALER—Dan Young, co-owner and manager of the Farmer's Corner, Lubbock, Texas, is shown standing beside one of the stacks of fertilizer he keeps in stock to supply the ever-increasing demand. Much of this is put out by his own spreaders, while another large quantity is sold every week to farmers who do their own spreading.

"Our wisest decision," said Dan Young, who is active manager of the firm, "was in deciding to do custom spreading of fertilizer for farmers. Sales began to climb, and a lot of farmers who had never traded with us began to find their way to the store."

The Youngs rigged up two tractors which can be used to spread either dry fertilizer or anhydrous ammonia. The initial cost of each tractor and equipment was around $4,400, but they believe it was a sound investment.

Each tractor can spread about 30 acres a day, for which the farmer pays $1 per acre. Then the fertilizer is furnished at regular prices.

After the fertilizer spreading season starts in January, the two tractors are busy until April 15. Then they come back with anhydrous ammonia and sidedressing during June and July.

One reason their tractors have been kept so busy, according to Dan Young, is that not many farmers in this area are experts on the various kinds of fertilizers. Furthermore, they know little about putting it on the land, don't have the kind of equipment needed nor the know-how of spreading it at the correct depth.

Since the charge of putting it in the ground is only $1 per acre, they are glad to buy the fertilizer from Farmer's Corner and get it put down.

Knowing what fertilizer is and how to recommend it is another selling point for the Youngs. Dan Young graduated from Texas Tech College a few years ago, where he majored in agronomy. This college training plus a lot of hard work and home study has made him an expert on farm chemicals.

When a farmer wants to fertilize his crop but doesn't know what kind of fertilizer to use, Mr. Young either goes to the farm after a soil sample or tells the farmer how to get one. This is then taken to a neutral laboratory for anaylsis, and the fertilizer recommendations are followed.

"This is good insurance to prevent making the wrong recommendation," Mr. Young said, "though I usually know what kind is needed. It takes some of the pressure off us, in case the farmer misuses his fertilizer then blames us."

The Farmer's Corner handles several well known brands of fertilizer and insecticides. In addition, it carries a full line of irrigation supplies, which includes plastic tubes, pipe, irrigation shovels, rubber boots and gloves, canvas aprons for diverting water, and dozens of miscellaneous articles.

"We do advertising, a lot of it," said Mr. Young. "But knowing our products, displaying them attractively, getting along with farmers and keeping up with new trends, all this has contributed to our steady business growth.

"A few years ago it seemed that every farm store in Lubbock was trying to sell fertilizer. A lot of them over-expanded and some sold too cheap. Others knew nothing about what they were selling, and as a result many farmers were disappointed when they followed a salesman's recommendations then didn't get an increase in crop yield.

"We've built up gradually and tried to do it on a sound basis. Fertilizers are changing so rapidly and so many new things are coming out on the market that a dealer must try to keep abreast of the major developments. I like to be in the position that when a farmer comes in and asks about fertilizer or insecticides, I can tell him something about it besides just reading the label.

"This keeps us from recommending something he doesn't need. If it won't help him make bigger crops or kill more insects, we tell him so. It may cost us a sale occasionally, but we make a friend and a future customer."

According to agricultural leaders in Lubbock, the Farmer's Corner is one of the two biggest sellers of insecticides and fertilizers in this city of about 130,000 people. What makes their growth even more remarkable is the fact that other firms had been in the farm chemical business two or three years ahead of them, and they had a lot of catching up to do.

A final reason for their success, as one customer put it, is that Farmer's Corner is a friendly place.

"I never got a bad deal here yet," he said. "They know their products, they're friendly and honest, and they know just as much about raising cotton as any of us cotton growers. We just do the irrigating and plowing; they'll take care of the fertilizing for us, and we both make money."

SHOP TALK

OVER THE COUNTER

FOR THE DEALER

By EMMET J. HOFFMAN
Croplife Merchandising Editor

Many of us who don't consider ourselves as old timers remember the day when grocers had to know quite a bit about the different varieties of coffee, tea, rice, beans, cheese and so on. Today, it would be safe to say that the grocery clerk knows more about merchandising than the merchandise itself.

There has been great progress made by manufacturers through the use of advertisements, labels, radio and television in spreading product information. This progress is certainly not to be condemned. But let's get specific and apply the effect of this trend to dealers of chemicals for the farm. We find in too many cases that the salesman has neglected to keep up with product information. In short, there are too many salesmen in the farm chemical field who are lacking product information.

In a personal experience the other day, I was told by a dealer handling fertilizer that "fertilizer percentages don't mean anything anyway" when the salesman was asked for a certain percentage lawn fertilizer. "One's as good as another," this uninformed salesman tried to point out.

True, this is an extreme case, perhaps, but it is safe to assume that much erroneous information about farm chemicals is being passed out by salesmen who lack product information.

The dealer who builds a staff of informed salesmen builds confidence in his store, his salesmen and his products.

Reliable and informed salesmen build a firm's reputation far and wide.

(Continued on page 11)

By RAMOND ROSSON,
County Agent
Washington County, Tenn.

Three weeks ago this county agent, 12 farmers and three dealers visited the Wilcox farm—62 acres open land—9/10 acre plowed for tobacco. No corn or small grain has been grown for several years. Twenty acres are in alfalfa, the balance of the 62 acres in orchard grass, rye grass and Ladino clover pasture.

The owner is milking 16 cows and growing out eight artificially bred heifers. The cows are producing a bit over 9,000 lb. He is buying grain, but feeding "one to five" no silage; $521 milk sales per cow; 165 hens $406 for eggs above feed purchased; $900 for 9/10 acre tobacco.

Well: "Wilcox, how did you do it"? one of the dealers asked. "By using 46 lb. nitrogen, 104 lb. phosphate and 48 lb. potash per acre." "This plant food was the best buy of the year and you know we had the worst drouth in our history."

"My cows just naturally look better and produce better when I use liberal amounts of plant nutrients," said Mr. Wilcox.

Last summer 80 county agents and agronomists from Oregon to South Carolina visited the Wilcox farm.

It isn't always the number of acres, it is how well fed and managed they are. Just remember, "Try fertilizing your acres instead of fertilizing the crops."

Soil Sampling Shows Lime Need in Oregon

CORVALLIS, ORE. — Results of 3,300 soil samples from the Willamette Valley the past two years show some lime is needed on most western Oregon soils, according to Oregon State College. For example, about 80% of these soils needed lime for best legume growth, and high soil acidity would have made it impractical to establish stands of legumes on 40% of these soils.

Coast county farmers were worse off. Out of 500 samples, about 90% needed lime for good legume growth, and 60% were too acid for growth of the most acid-tolerant legumes.

Placement Trials

SACRAMENTO — Torrey Lyons, Sacramento County (California) Crop adviser, reports that fertilizer trials at the Rice Experiment Station at Biggs, Cal., have shown the method of applying fertilizer is important. He said that tests showed best results were obtained when fertilizer was drilled four inches under the ground while broadcasting and disking gave next best results.

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BIGGER PROFITS

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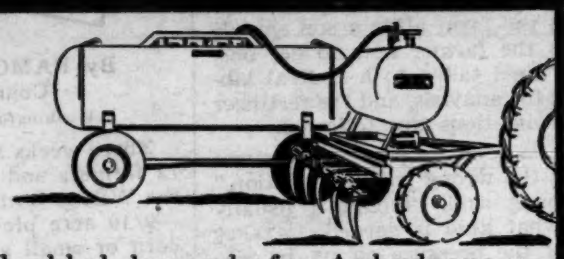
with storage and handling equipment built by BEAIRD



TODAY'S doubled demands for Anhydrous Ammonia mean doubled profits for you if you have adequate storage and handling equipment. Beaird helps you meet these equipment requirements with the first complete line of equipment for every plant and field need. Now, through Beaird you can consolidate your purchasing, financing and service responsibility at a single source. You also benefit from the latest design improvements that make NH3 easier, safer to use, and from Beaird's experienced engineering and planning assistance to help you with your storage requirements — all without extra cost.

More and more dealers are relying on Beaird equipment for the extra storage facilities needed to meet today's doubled production and demand. At the plant or on the farm, Beaird safety-built storage and handling equipment is your sure way to bigger profits in anhydrous ammonia. *Before you buy, ask your Beaird representative about a planned storage and field equipment program designed to fit your requirements.*

FOR APPLICATION

Beaird applicator tanks — 110, 150, and 200-gallon sizes. Available unfitted or fitted with highest-quality fittings. Gleaming white "Weather-Weld" enamel finish.

FIELD STORAGE

Beaird packaged storage station available for do-it-yourself installation with all necessary pipe and fittings, pump and safety controls. Shown: 6,000-gallon; other sizes from 2,000 to 30,000 gallons.

MOBILE FIELD SUPPLY

Beaird truck and trailer tanks, 500 and 1,000-gallon sizes, equipped with internal baffles to meet all state regulations. Dual fill valve couplings cut filling time in half. Long lasting gloss white "Weather-Weld" enamel finish.

A pioneer in the development of safe storage for anhydrous ammonia

THE J. B. BEAIRD COMPANY, INC.

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RINGING THE cash register

Merchandising Hints for The Retailer

Bonus Plans

Employee bonus plans take varying forms but one successful Illinois dealer finds his system of basing it on the previous year's business works best. Five percent of all sales over that is divided equally among all employees. Seventy-five percent of this bonus is paid monthly—25% at the end of the year. A Missouri dealer pays his foremen 1% of the net profit each month. Other employees receive ½ of 1%. If a month shows a loss, nothing is deducted, but bonuses are not resumed until this loss is made up. Employees with one year or more of service are eligible. The owner states that 75% of the employees are definitely more interested in doing a more efficient job.

Wide Awake

Dealers who win the friendship and cooperation of the press and radio know that valid publicity gives customers the impression that they are dealing with a wide-awake and progressive store. There are a few simple steps every dealer should take to win the friendship of press and radio representatives. First, get to know your local editors and radio station newsmen and owners. Secondly, inform them promptly when you have news. This might include announcements of new personnel, store expansion or a new service. Lastly, supply them in person with material on the value of farm chemicals and what they mean to the customer. Also news of associations to which you belong has a legitimate place in the news columns and newscasts of papers and radio stations in your home town.

Contest For Kids

Parade time is coming and any farm supply dealer who has an opportunity to assist in a parade and celebration can gather an unusual amount of publicity with a comically dressed dog contest. One store owner advertised heavily in advance that he was staging a "most comically dressed dog contest" in the store. Prizes were listed. Ads featured the store owner's daughter with her comically dressed pet although she and other store employees' children were not eligible for prizes. Prizes were awarded at the store on a pre-announced date. Any retailer who stages such an event will find that comically dressed dogs provide a most entertaining part of any parade, provided the dealer can tie-in a contest with a civic celebration.

Speechless Salesmen

A display without a sign and price card is like a salesman who can't talk. Neither a display nor a salesman can do business for you if they can't "talk."

How to Be Different

One dealer put it this way: "I am very much like a bank. I deal in merchandise that is priced pretty much the same all over town. My store looks quite a bit like other stores and all I have to offer that is different is 'me' and my services. I am going to make that 'me' and my services so different that farmers won't think of feeds, farm chemicals and supplies at all—they'll just think of 'me' and my services."

How to Get A Good List

A good direct mail list is essential in making this form of advertising reach full effectiveness. A customer who has moved out of the trade area is worthless on a direct mail list and means money wasted. Every good name omitted means a prospect is not being reached. Lists should be compiled under the dealer's own guidance and revised every six months. Names may be secured by the dealer and his employees jotting down the names and addresses of the customers they know personally after they leave the store, from the telephone book, bookkeeping list, government records, county agents, registration lists in connection with a contest or drawing or by exchanging names with another merchant. When such a list is complete it may be divided according to desirability and what type of merchandise the customer most often purchases.

Hire a Student

Many dealers have solved the problem of arranging displays and changing them regularly by hiring a high school student. The local high school superintendent will be glad to suggest the names of students who have an interest in and talent for making displays and doing lettering. The dealer then selects one of these students and hires him to work on a display once a week or twice a month, whichever he desires. Manufacturers' representatives will be happy to cooperate with the youngster in working out ideas and themes for displays. Dealers have found that for a small sum of money they can create effective displays at a low cost for labor and materials.

FARM SERVICE DATA

Extension Station Reports

J. N. Roney, extension entomologist for the University of Arizona, advises growers to be alert for the four main springtime enemies of young cotton plants — thrips, beet armyworms, darkling beetles and aphids. His advice:

Thrips are best controlled with ground sprays. Apply insecticides when an average of one thrip is found on a young cotton plant. It's too late to get best protection from any recommended insecticide after the leaves of the plant begin to curl.

The beet armyworm is an early bird when it comes to raising havoc with young cotton. Later, the worms can damage cotton squares. Both dusts or sprays are effective in the control of beet armyworms here in Arizona.

Darkling beetles—chewing insects—are found in cotton following alfalfa or grown in light, rich soils. Use poison baits, dusts or irrigations for long periods after the cotton has sprouted.

Growers have to fight aphids throughout the entire growing season. But, if found in cotton at the beginning of the season, they should be controlled. This cuts damage later on to open cotton bolls. Both dusts and sprays are effective in controlling aphids.

★

Two years of testing by the Colorado A&M Experiment Station at Rocky Ford and Fort Collins have brought out promising measures for chemically controlling early grass and broadleaved weeds in onions.

A station scientist reports control of weeds without injury to the crop. But he cautioned that care must be used in measuring materials and timing applications. The chemical Chloro-IPC was used at the rate of 3 lb. per acre in 100 gal. water.

The spray was applied twice; two weeks before emergence of the onions and again one week prior to emergence. For banding the spray material, growers should reduce the amount of spray accordingly.

Dr. A. C. Ferguson, associate horticulturist for the Colorado A&M Experiment Station who directed the tests, pointed out that the pre-emergence spray will not control weeds for the entire season. However, onions treated in this way suffer less from competition by weeds early in the season.

A single spray of 4 lb. per acre in 100 gal. water of Chloro-IPC also worked well when applied 10 days to two weeks prior to emergence of onions, but results were not as satisfactory as with the two-spray system, Dr. Ferguson said.

He also reported good control of weeds after onions were up with the weed-killer Aero Cynate. He cautioned that onions must be treated no earlier than the two-leaf stage to avoid reducing the stand. Weeds must be very small for best success with this treatment. The scientist recommends 7½ to 10 lb. Aero Cynate per full acre of coverage in 100 gal. water.

★

Tiny, near-prehistoric animals are giving some Washington farmers a hard time. But Washington State College agricultural scientists think they may have a solution to the invaders.

The pests are symphylids. They're small, white centipede-like animals with an unquenchable appetite for germinating seeds and the roots and root hairs of plants. They've been a problem to farmers in widely scattered Washington locations since 1953.

Last year, Dr. R. M. Bullock, superintendent of WSC's southwestern Washington Experiment Station, Vancouver, and Dr. Angus Howitt, assistant entomologist at the western Washington Experiment Station, Puyallup, were able to control symphylids in experimental areas with parathion. They feel that the organic phosphates show real promise of solving this problem.

Symphylids aren't insects but very primitive animals. Scientists say they're probably the connecting link between insects and the lower forms of animals such as centipedes and millipedes. So far as is known, there are no plants resistant to their attack. They do the most damage to row crops such as beans, peas and corn. Damaged plants have no fine feeder roots so essential for the plant's growth. Usually all that remains is the bare tap root.

★

New control programs for diseases and insect pests that attack stone fruits in Oregon have been published in an Oregon State College extension service circular. Spray recommendations for cherries, peaches, prunes, plums and apricots are charted in the circular that also includes a section on proper handling of spray chemicals.

OVER THE COUNTER

(Continued from page 9)

Don't rule out production information as the first step in selling. Don't rely entirely on labels, advertisements and college bulletins although these are most desirable.

Product knowledge means selling power.

"Growing Pains" is the interesting title of the monthly publication of AFC, Inc., Kern County, California, fertilizer and farm chemicals company. After seeing a copy sent to Croplife by its editor, Roy Westphalinger, we agree with him that its a good promotion effort that will "really pay off."

Kern County farmers are a diversified group, producing potatoes, peas, grapes, alfalfa and many other crops. Its potential for fertilizer, pesticide and weed control materials is great. AFC, Inc., owned by Jimmy Bonaventura and Buzz Waterman, plan to maintain their share of the sales and reason wisely that a monthly bulletin to farmers will be a profitable investment.

The April bulletin is one designed to attract all farmers. The bulletin uses lots of names, news, tidbits about what farmers are doing and crop developments. On the front page is a picture taken on the Mettler Ranch at Wheeler Ridge where 900 lb. of fertilizer is being applied per acre simultaneously with the seeding operation. The caption states that the operation proved very successful last year. The bulletin picture is an excellent way of spreading the gospel of fertilization.

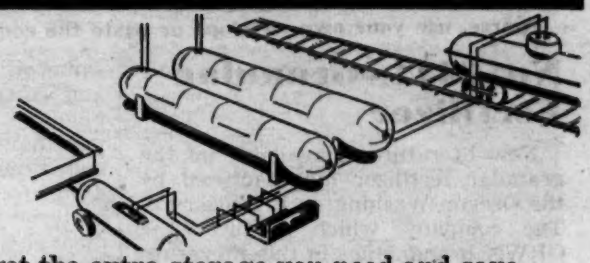
Other sections of the April bulletin tell about the yellow clover aphid found in Kern County, a new systemic grass killer, ferric sulphate use, grape vineyard developments and potato crop information.

Here's smooth sailing for the newest promotion venture of AFC, Inc., of Edison, Cal.

DO-IT-YOURSELF

SAVE UP TO 1/3

...on installation costs with BEAIRD'S packaged storage stations



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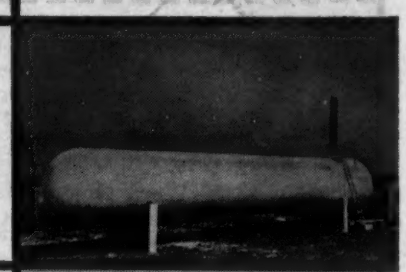
Preassembly at Beaird and easy-to-follow building plans make it easy for you to install the complete packaged plant with minimum field work and outside labor. Much of the installation may be made by your own employees. As further assurance of proper assembly, a Beaird field engineer supervises the entire installation, including unloading, placing tank on foundation and piping as well as unloading the first car of ammonia for you and demonstrating the plant operation to your employees.

Before you build your bulk plant, see how much you may save by installing your own Beaird packaged storage station. *Write today or ask your Beaird representative for a quotation on your requirements.*

SINGLE TANK

30,000-gallon "do-it-yourself" bulk storage station installed for plant or field storage. Beaird do-it-yourself packaged bulk plants are individually designed with one or more tanks to fit your requirements, engineered to meet all state and code regulations.



DOUBLE TANK

Packaged installation of 30,000-gallon tanks. Other sizes: 2,000 to 30,000-gallon capacity. Identical bulk plants may be ordered on a "turn-key" job basis, with Beaird field engineers handling every detail.

SINGLE-BARREL TRANSPORT

Bigger payloads for dealers — new Beaird 6,165-gallon trailer transports for NH3. Designed to eliminate dead weight, transports deliver bonus payloads up to 1,000 gallons.

BEAIRD

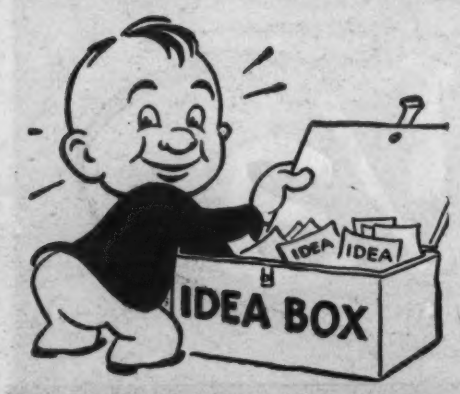
THE J. B. BEAIRD COMPANY, INC.

Shreveport, Louisiana

Stockton, California

BEAIRD

Better Selling
Richer Sales Fields for Dealers



What's New...

In Products, Services, Literature

You will find it simple to obtain additional information about the new products, new services and new literature described in this department. Here's all you have to do: (1) Clip out the entire coupon and return address card in the lower outside corner of this page. (2) Circle the number of the item on which you desire more information. Fill in your name, your company's name and your address. (3) Fold the clip-out over double, with the return address portion on the outside. (4) Fasten the two edges together with a staple, cellophane tape or glue, whichever is handiest. (5) Drop in any mail box. That's all you do. We'll pay the postage. You can, of course, use your own envelope or paste the coupon on the back of a government postcard if you prefer.

No. 6244—Granular Fertilizer

New literature is available on the granular fertilizer manufactured by the Oregon-Washington Fertilizer Co. The company, which produces the ORWN brand, staes in this literature that its product is dry, free-flowing and will not clog. Literature available includes a home growers' guide which outlines instructions for lawn, vegetable and flower garden care and planting instructions. To secure this literature check No. 6244 on the coupon and drop it in the mail.

No. 6245—Insecticide

Methyl parathion, an organic phosphate insecticide recommended for the control of insects and mites on cotton, now is available in commercial quantities from Monsanto Chemical Company's organic chemicals division. The compound is said to be effective in controlling the various species of aphids and mites when properly formulated and applied either as a liquid or a dust. It also is of value for boll weevil control. The properties of methyl parathion are similar to those of parathion, Monsanto's Niran. It has essentially the same order of toxicity as the latter, and equal care is necessary in the handling of it. Samples of methyl parathion, information on its properties and instructions for safe handling, formulating and applying the material are available on request. Just check No. 6245 on the coupon and drop it in the mail.

No. 6234—Alfalfa Weevil Control

A two-color mailing piece on alfalfa weevil control with heptachlor is available to insecticide formulators, distributors and dealers. The 8½ in. by 11 in. piece folds to handy mailing size and is ready for immediate use. Ample space is provided for dealer imprinting if desired. The folder tells actual case histories of heptachlor use in alfalfa country along with rates and methods of application. For a free supply check No. 6234 on the coupon and mail it.

No. 6242—Weed Killer

The Pacific Coast Borax Co.'s agricultural sales division announces the introduction of DB-Granular, a weed killer designed for agricultural weed problems including deep-rooted noxious perennial weeds. The product is a complex of disodium tetraborate and 2,4-dichlorophenoxyacetic acid. This new herbicide is applied in dry form just as it comes from 50 lb. multiwall paper sacks. DB-Granular for agricultural use is a companion product to the company's new Ureabor introduced recently for industrial weed problems. To secure more complete details check No. 6242 on the coupon and mail it.

No. 6241—Soil Fumigant

Nemagon, a new soil fumigant for control of nematodes, which is said to have great stability in the soil, is now available for limited commercial use, it was announced by officials of the Agricultural Chemicals Division of Shell Chemical Corp. The product has been tested on cotton, grapes, citrus, and other tree crops such as peaches and walnuts. Some crops appear tolerant enough of this chemical so that applications can be made around the roots of the living plant, it is claimed. With established trees, applications of five to 10 gal. per acre have been used for control of a wide variety of nematodes to a depth of 4-6 ft. Nemagon (1, 2-dibrome, 3-chloropropane) is currently being manufactured on pilot plant scale. Both liquid and dry formulations are being marketed. The product will be available for limited sales this season on such crops as citrus, cotton, and grapes. Nation-wide marketing is expected in 1956. To secure more complete details check No. 6241 on the coupon and mail it.

No. 5058—Tractor Shovel

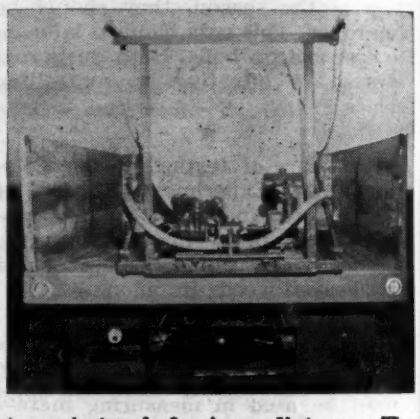
The Frank G. Hough Co. announces production of an improved Payloader tractor-shovel with bucket capacity of 1 cu. yd. payload and ¾ cu. yd. struck load. Designated as the model HFC, it is a rear-wheel drive model and features a combination of special new transmission, plus torque-converter drive. The torque-converter is of the self-cooled, 3-element type which automatically multiplies torque output of the engine in direct proportion to the load requirements. The transmission is of full-reversing type, giving four speeds forward and four reverse up to 28 mph. To secure more information check No. 5058 on the coupon and drop it in the mail pon and mail it.

No. 6232—Pump

Hypro Engineering, Inc., is manufacturing a sprayer pump, called model 150, designed for such agricultural applications as high volume spraying and rapid transfer of liquid fertilizer. Capacity of the pump is over 30 gal. per minute at tractor power take-off speed (500 r.p.m.) and it has a flow rate of over 65 gal. per minute at its maximum recommended speed of 1,100 r.p.m. Highest suggested pressure limit is 150 lb. per square inch. Case and rotor of the pump are available in cast iron or a nickel-iron alloy. Rollers are of resilient nylon for positive liquid displacement. The pump is self-priming and is equipped with permanently lubricated ball bearings. Check No. 6232 on the coupon, mail it and more complete details will be sent to you.

No. 6240—Fertilizer Applicator

Aylward Fertilizer Co. is producing a new, complete analysis liquid fertilizer applicator which has a capacity of 500 gal. The unit is complete, ready for placing on the customer's truck for immediate use. The applicator has a stainless steel boom and pump. One round in the field, covering ¼ mile will fertilize two acres. Secure more complete details by checking No. 6240 on the coupon and mailing it to this newspaper.



No. 6235—Weed Control Guide

The Cooperative G.L.F. Exchange, Inc., has issued its chemical Weed Control Guide for 1955. Included in the 56-page booklet are chemical weed controls for the dairyman, cash crop and vegetable grower, farm home and fruit grower, based on the most recent recommended practices. The guide also suggests control measures which may be used on a trial basis only. Specific controls of problem weeds in field and garden crops are given. Aquatic weed control, soil sterilization and instructions in the use of weed killers and equipment are also included. To obtain a copy check No. 6235 on the coupon and drop it in the mail.

No. 6239—Fly Killer

Ortho fly killer dry bait is the name of a new product that is said to kill both resistant and non-resistant house flies economically and safely, according to its manufacturer, California Spray-Chemical Corp., which has brought it out as a companion product to its liquid bait Ortho fly killer M. The dry bait product utilizes the particle size basis in its malathion formulation. A Cal spray spokesman said: "A study of fly feeding habits revealed that the insects like to pick up particles of a size relative to the size of a football to man. They can't eat a particle of this size, any more than a man could

Also Available

The following items have appeared in the What's New section of recent issues of Croplife. They are reprinted here to help keep retail dealers on rotational circulation informed of new industry products, literature and services.

Send me information on the items marked:

- ☐ No. 6231—Liquid Fertilizer
- ☐ No. 6232—Pump
- ☐ No. 6233—Herbicide
- ☐ No. 6234—Weevil Control
- ☐ No. 6235—Weed Guide
- ☐ No. 6237—Space Fumigant
- ☐ No. 6238—Lawn Booklet
- ☐ No. 6239—Fly Killer
- ☐ No. 6240—Applicator
- ☐ No. 6241—Fumigant
- ☐ No. 6242—Weed Killer
- ☐ No. 6244—Fertilizer
- ☐ No. 6245—Insecticide
- ☐ No. 6246—Transfer Pump
- ☐ No. 6247—Lawn Fertilizer
- ☐ No. 5058—Tractor Shovel

NAME .....

COMPANY .....

ADDRESS .....

—CLIP OUT—FOLD OVER ON THIS LINE—FASTEN (STAPLE, TAPE, GLUE)—MAIL—

FIRST CLASS
PERMIT No. 2
(Sec. 34.9, P. L. & R.)
MINNEAPOLIS, MINN.

BUSINESS REPLY ENVELOPE
No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY—

Croplife

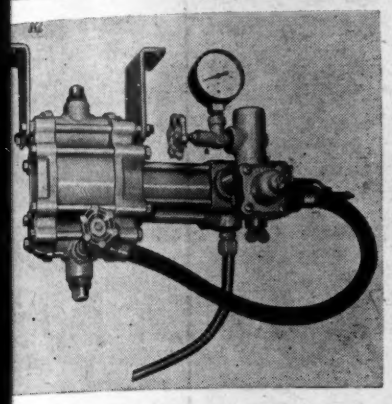
P. O. Box 67,

Reader Service Dept. Minneapolis 1, Minn.

allow a football. A single particle, erefore, may serve as a final meal r a number of flies." No mixing is cessary. Available in 1-lb., 5-lb. and -lb. sizes, the product is claimed to sist caking. More complete details e available. Check No. 6239 on the upon, clip and mail it to this newsper.

o. 6246—Transfer ump

A new pump for fast transfer of hydrous ammonia has been anunced by the John Blue Co. The mp starts and stops with a twist a valve, according to a company nouncement. It uses a small quan-



ty of ammonia vapor to drive the ansfer pump, thereby reducing loss. low rates of 20 gal. per minute or ore may be obtained with a loss of ree-tenths of 1%, it is claimed. his means that a 100-gal. tank may filled to 80% in 5 min. The pump easily installed and weighs 27 lb. he firm's announcement states that e saving in ammonia alone will pay r the compressor within a short me and that it has other features ch as low initial investment, elimiation of the defoliation of crops and ritation to bystanders. Secure more tails by checking No. 6246 on the upon and mailing it to Croplife.

o. 6238—Lawn ooklet

A new booklet entitled, "How to ill Lawn Insects with Dieldrin," has en prepared by the Shell Chemical rp. Illustrated in four colors, the -page booklet contains a wide vaety of information about turfilling bugs and how to treat them ith various dieldrin formulations. rotection of ornamentals is covered the new booklet and there is a ecial section on application of dielin for control of household insects. copy may be obtained by checking o. 6238 on the coupon and dropping in the mail.

o. 6237—Space umigant

A new space fumigant, "Bromo-," has been introduced by Ameri- Potash & Chemical Corp. The w product is a mixture of ethylene bromide and methyl bromide, both which have been used in the past fumigate storage houses. Control pests in grain, flour, rice, cheese d dried fruits is claimed for the oduct. More complete details will sent if you will check No. 6237 the coupon, clip and mail it.

o. 6231—Liquid ertilizers

Liquid fertilizer formulators, disributors and dealers, as well as supiers, will find a new booklet, Preparation of Liquid Fertilizers," epared by the Victor Chemical orks of interest. In eight pages the oklet describes the preparation of lutions, the batch procedure, and a art showing the proportions of emicals used to prepare liquid fertilizers to various strengths. The booklet also lists in detail the equipment recommended for a plant capable of producing five to 10 tons an hour of liquid fertilizer, tells the cost, and gives a flow diagram of a plant for the preparation of liquid fertilizers. The booklet may be obtained by checking No. 6231 on the coupon and mailing it.

No. 6233—Herbicide

Baron, a nonselective herbicide, is now available for industrial use, the Dow Chemical Co. announces. The new product is a liquid which emulsifies readily in water. Active material in Baron is 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate. For convenience this chemical has been given the coined common name erbon. It is said to embody a new chemical characteristic as the basis for its effectiveness. Baron contains 4 lb. of technical erbon per gallon. Baron may be sprayed on leaves, which take it up directly; or it may be sprayed on the soil, from which it is taken up by roots. Its translocation from leaves is relatively independent of rainfall moisture. It is claimed that when it is applied to the soil it acts as a residual sterilant, lasting for approximately a season, its effective persistence depending upon various factors. Secure more complete details by merely checking No. 6233 and mailing the coupon.

No. 6247—Lawn Fertilizer

Plantrons, a new high-analysis, soluble fertilizer in bead form for home lawns and gardens is being test marketed in the San Diego, Kansas City, Cleveland, Columbus, and Springfield, Mass., areas by Forward House, Inc., a division of Olin Mathieson Chemical Corp. Patterned after the high analysis pelletized commercial fertilizers produced by Olin Mathieson, Plantrons has a basic formula of 12% nitrogen, 24% phosphorus and 12% potassium. It also contains 0.1% each of iron, copper and zinc, plus chelating agents to solubilize these elements and make them immediately available to plants. The product is completely soluble and thus can be applied either dry or in solution. It has a green color and mint odor. The product is packaged in 4-oz., 1½-lb., and 5-lb. cans and 10-lb. and 25-lb. cylindrical fiber containers. To secure more complete details check No. 6247 on the coupon and mail it to Croplife.

Pittsburgh
SYSTOX*
THE REVOLUTIONARY SYSTEMIC INSECTICIDE

Here's where you can CASH IN on it!

COTTON: Provides excellent control of Aphids and Two-Spotted Spider Mite.

APPLES: Up to 100% control of such fruit-destroyers as Rosy Aphid, Wooly Aphid and European Red Mite!

POTATOES: Increases potato income by excellent control of Aphids and Leafhoppers.

CALIFORNIA CITRUS: Provides fast, long-lasting clean-up of Aphid and Mite infestations.

ORNAMENTALS: Ideal for control of Mites and Aphids on ornamentals.

Systox, the first systemic insecticide approved for use in this country, is absorbed by plants from foliage or soil and translocated upward and outward. Entire plant, including growth developed after application, is rendered toxic to sucking insects. Systox is effective longer than conventional sprays, can't wash off, won't harm insect predators! Write for complete information today!

Standard for Quality

For immediate information about Pittsburgh Agricultural Chemicals, write or call your nearest Pittsburgh Coke & Chemical office at:

Atlanta • Los Angeles • Chicago • Dallas
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AGRICULTURAL CHEMICALS DIVISION
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Grant Building • Pittsburgh 19, Pa.

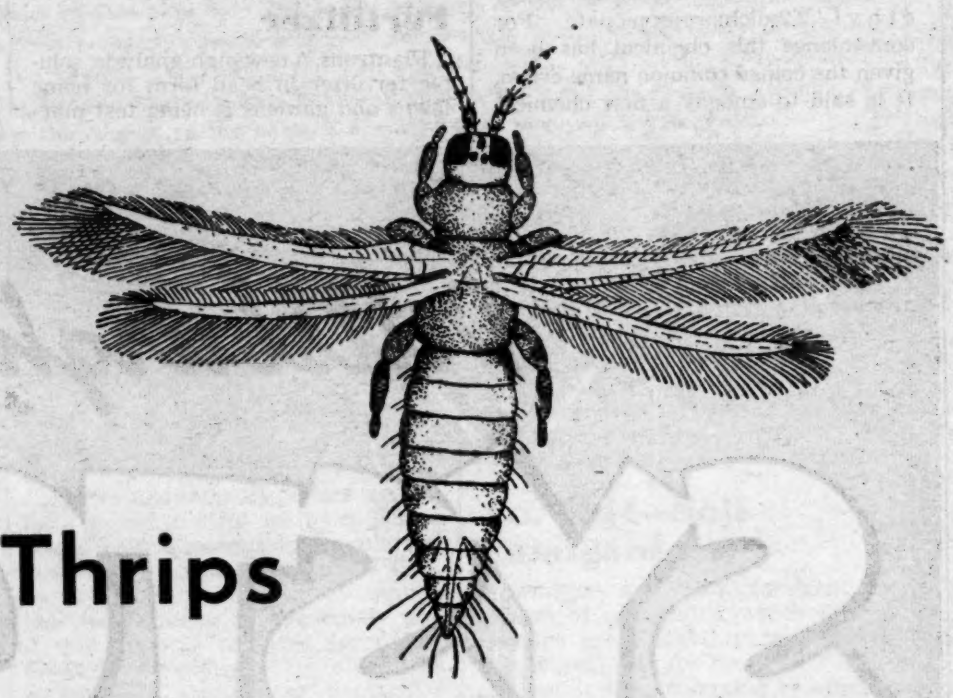
*Systox, developed by Farbenfabriken Bayer, Germany, is a trademark of Chemagro Corp., New York, New York.

WAD 5636

COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

BUG OF THE WEEK

Mr. Dealer--Cut out this page for your bulletin board



Thrips

How to Identify

Thrips are small insects, rarely as long as an eighth inch. They feed on the sap of various plants. Many thrips have four wings which are laid back over the abdomen when at rest. The wings are narrow and are fringed with long hairs, which account for the name of the order, Thysanoptera, which means "bristle wings." The foot of the thrip is peculiar, having no claws, but only hooflike depressions surrounding a small bladder.

Habits of the Thrip

Eggs are laid on the tissues of various plants as a rule, although in some species of thrips, eggs are inserted into slits in the plants. Habits vary somewhat with the species of thrips. Gladiolus thrips, for instance, overwinter and may reproduce on the stored gladiolus corms. During the growing season, the larvae and adults attack the foliage and flowers of the growing plant. In the summer, a generation of the thrips may be completed in 2 weeks. Onion thrips pass the winter in the north in both adult and larval stages, on onion plants left in the fields, and in the crowns of alfalfa and clover. The female lays her small whitish eggs in the more slender tissues of leaves. These eggs hatch in from 4 to 10 days. The larvae begin eating as soon as they are hatched, pass through two stages while feeding upon the plants and complete their growth in about five days. They then enter the soil where they pupate. The pupal stage lasts about four days under favorable conditions. A generation thus is completed in about 2 weeks. Generations overlap and all stages may be found in fields during the summer.

Damage Done by Thrips

Thrips damage a wide variety of flowers and crops, including onions, tobacco, citrus and cotton. They pierce the skin of young plants and then suck the sap, leaving malformed seedlings. In cotton, they punch holes in the cells of new cotton leaves and prevent full growth. The tobacco thrip mars leaves used for cigar wrappers and also injures seedling peanuts, causing many to die. The gladiolus thrip ruins flowers and foliage of growing plants. Plant viruses are known to occur in the order Thysanoptera, which includes thrips. The insect gets the virus from a diseased plant, then moves to a healthy plant and infects it during the feeding process.

Control of Thrips

Materials for control of thrips differ considerably for various species of thrips. Aldrin and dieldrin, DDT, lime sulfur, wettable sulfur, nicotine sulfate and DDT-sulfur dust are mentioned in different sources as being effective. Due to the many species of thrips and specific recommendations for control of each, it is not possible here to describe details of each. Entomologists emphasize the importance of timing in the control of thrips.

Drawing of thrip furnished Croplife through courtesy of U.S. Department of Agriculture.

Previous "Bug of the Week" features are being reprinted in attractive 24-page booklet, priced at 25¢ single copies; reduced rates in quantities. Write Croplife Reprint Dept., Box 67, Minneapolis 1, Minn.

Doing Business With

Oscar & Pat

When Oscar came back from lunch he always took the 11 a.m. until oon hour because he got to the store teen minutes early every day—he rried a package under his arm. sually, Oscar scowled most of the y as he went about seeking for ays to cut down waste in the store erations, but today there was the int trace of a smile on his pudgy ce and a flicker of contentment in s grey eyes.

Oscar did not unwrap the package ght away. He waited until Pat, his rtner, went to lunch, and until illie finished her sandwich lunch and ent to take a walk. Then Oscar niled and unwrapped his package.

It proved to be a heavy plastic miniature of a fierce green bulldog. On the base of the piece where the bulldog's sturdy feet rested lay a big red piece of meat. The bulldog's fangs were bared and the look in his eyes sent a chill through anyone who dared look his way.

The thing was a paper weight. It ipped open on the side, too, and scar now poured the retrieved paper lips from his glass bowl into the ceptacle, closed the lid of the bull- g and put the glass bowl back at e rear of his desk.

Oscar then placed the weighted ulldog near the edge of his desk, ght near the chair which salesmen sually took when they came to call the firm. And since Pat was out in e field selling most of the time, it as Oscar who made first contact ith salesmen when they called.

That is, the new salesmen called on scar. The older, wiser ones had und it convenient to make appointents with Pat by phone to meet him a coffee shop, hotel or even at his me where they could conduct their les presentations without being rced to endure Oscar's icy stares d disapproval.

As Oscar worked during the lunch ur on bills and budget sheets, he uld occasionally look at the bull- g guarding the red meat and smile. was symbolic, that bulldog on ard; he hoped that salesmen, yes, d even Pat, got the meaning.

"Good morning, sir. I'm Jerry agen, with the Tri-State Chemical . of Ellsberg."

Oscar frowned, looked up and saw keen-eyed man of about 30, clean aven, clad in a blue suit and carry- g the inevitable brief case.

"We're not buying anything this eek," Oscar informed him with the eath of ice in his voice.

The salesman smiled and sat own. "All right, you don't have to uy. But I'd like to tell you a little bout our new insecticide line. We've got a dandy product which eally annihilates the potato leafopper and is deadly to the tomato ornworm. It's selling like wildfire n many places."

"Let it sell," Oscar said discouously. "We've got enough right now do to sell what we've got. Look at ose shelves." He waved his pudgy nd at the wall displays. "Look at ose counters. Merchandise, merandise, merchandise. All over the ace. And more — more coming, I ppose. There's so much around here fall all over it. And the warehouse 's full to the rafters."

"Oh," said the salesman sympaetically. "Aren't business conditions oming around here? Other places e visited dealers say they are about ahead of last year."

"Huh," snorted Oscar. "What's the use of selling, when you have to worry and sweat and try to collect, when customers try to chisel and get bigger and bigger discounts, when employees sleep on fertilizer sacks in the warehouse every chance they get and want more and more money per hour? Business—bah! Wish I was out of it."

The salesman looked at Oscar's disgusted face, then at the bulldog with bared teeth. "There are always problems in business," he said consolingly, and with a note of hope, "but they can be overcome with good merchandising ideas which create new business and bring in extra sales." He smiled brightly.

"Now, if you buy some of our products we'll give you an animated point of sale sign that wows prospects. It's a wheel with a spotlight on it. The wheel comes out of the lower box showing one big hornworm after the other just aching to eat tomato plants. But as the wheel turns up we see a man with a duster. He shoots our product at the hornworm, then the wheel turns up another big hornworm lying on his back, legs up in the air, deader than a doornail. Quite an idea, isn't it? Dramatic, too."

Oscar only looked coldly at the salesman and said nothing, but his irritation was plainly evident, but not to the enthusiastic salesman. "And we've got a mosquito spray which is sensational. Comes in a handy container and can be used by anyone outdoors, at swimming parties, lawn parties, baseball games. I'll even help you fellows introduce it around these parts, if you stock it. I'll visit some golf clubs and tell them you have a stock of it, and I'll spray some around to convince them."

Oscar's fist came down hard on his desk, so hard that the bulldog jumped a half inch. "Don't you understand English?" he thundered. "I said we're not buying anything this week, maybe not for six weeks. I'm busy!"

Startled, the salesman's eyes popped wide open. His mouth gaped. Shakily he got to his feet, gave one quick look at Oscar and then at the fierce bulldog, then in a daze he made his way toward the door, a slim hand holding his felt hat. Outside, he looked up and down the street.

"Maybe I'd better go—go back to the shipping room," he mumbled, wiping the perspiration from his brow. "T—this selling game is t—too rough for me."

IMC PLANT

CHICAGO—International Minerals and Chemical Corp. will start construction immediately on a nepheline syenite plant to cost $1,500,000 at Blue Mountain near Havelock, Ont., according to Louis Ware, president.

Test Your FERTILIZER I. Q.

By DR. MALCOLM H. McVICKAR
Chief Agronomist, National Fertilizer Assn.

Q. What are the more common fertilizer materials supplying phosphoric acid?

A. Most of the fertilizer phosphoric acid is in the form of superphosphate. There are two kinds. Normal superphosphate contains 18% to 20% available phosphoric acid while concentrated superphosphate contains 40% to 50% available phosphoric acid. Both are made by treating phosphate rock with sulfuric acid. One hundred pounds normal superphosphate, in addition to the phosphoric acid, carries approximately 20 lb. calcium and 12 lb. sulfur in the form of gypsum. Concentrated superphosphate is like normal superphosphate, but since the gypsum is removed, it has a higher percentage of available phosphoric acid.

Just scatter this bait as you walk

and kill flies

A dry granule bait—kills both resistant and non-resistant house flies.

New, easiest way ever to control house flies in and around barns, poultry sheds, out buildings, stables, garbage disposal areas, drive-in restaurants.

Simple as shaking salt — Open the shaker can and scatter lightly around fly feeding areas.

Fast! You can bait several hundred square feet in 2 or 3 minutes.

Effective! This attractive-type bait lures flies, they feed and die.

Low cost, too! One pound covers 2,000 square feet of fly feeding areas.

Space spray gives rapid knockdown

ORTHO Fly Spray is an ideal space spray which gives quick kill on contact and provides excellent control of the lesser house fly.

On all chemicals, read directions and cautions before use.

World leader in scientific pest control

ORTHO
SCIENTIFIC PEST CONTROL

T. M. REG. U. S. PAT. OFF.: ORTHO

CALIFORNIA SPRAY-CHEMICAL Corp.
(Offices throughout U. S. A.)

LP stands for

Fumigant Specialists

SOIL .... GRAIN .... INDUSTRIAL

LP **SOIL FUMIGANTS**

Larvacide (99% pure chlorpicrin). Controls most disease-causing fungi, weed seeds, nematodes and soil insects. Recommended for use in greenhouses, cold frames, seed beds, flats, compost and potting soils.

BROMEX—Contains methyl bromide in solution, for greenhouse and seed bed soils, to control rootknot nematode. Quick aerating. May be used in presence of living plants.

PESTMASTER Methyl bromide—with 2% chlorpicrin. For seed beds, etc.

LP **INDUSTRIAL FUMIGANTS**

Larvacide (99% pure chlorpicrin). Destroys insects and rodents in flour, feed and rice mills, grain elevators, seed warehouses, vaults and on farms. Its tear gas warning makes LARVACIDE a safer fumigant.

METHYL BROMIDE — A standard fumigant for many purposes.

LARVABROME—for fumigating where tightest sealing is not possible. Combines the advantages of LARVACIDE and methyl bromide.

L-P SPRAY — Non-toxic oil formulation of activated pyrethrins for spot sanitation.

LP **HORTICULTURAL SPECIALTIES include**

Z. I. P. and NO NIB'L.—Taste repellents for deer, rabbits and field mice. Widely used by commercial growers and home gardeners.

MILDEX—A fungicide for eradicating powdery mildew of apples, cucurbits, roses and other crop plants.

PLANTEX—Anti transpirant for reducing moisture loss and enhancing survival of seedlings and woody transplants.

LARVACOVERS—8 gauge, extra sturdy vinyl covers to retain gas in fumigating soils, grain, etc. Florist green or clear.

Write for literature on any of the above products

Larvacide Products, Inc.

117 Liberty Street, New York 6, N.Y.

WEST COAST—1515 Third Street, San Francisco

Available Now!

Reprints of Croplife's Feature

Bug of the Week

Twenty four of the insects described in Croplife's weekly feature, "Bug of the Week," have been reprinted into an attractive 8½ x 11 inch booklet for distribution to the trade. The price is 25c each in quantities up to 100; 20c each in quantities of 100-1,000, and 15c each in quantities over 1,000. Firms may have their names imprinted on the back cover at a moderate extra charge.

Included in the booklet are the following insects:

Alfalfa Weevil
Armyworm
Boll Weevil
Chinch Bug
Cotton Bollworm
Cutworm
Grasshopper
Imported Fire Ant
Lawn Chinch Bug
Lygus Bug
Meadow Spittlebug
Mosquito
Northern Corn Rootworm
Onion Thrip
Plum Curculio
Potato Leafhopper
Seed Corn Maggot
Sweetclover Weevil
Tarnished Plant Bug
Tobacco Hornworm
Tomato Hornworm
Tuber Flea Beetle
White Grub
Wireworm

Order From Reprint Department

Croplife

P.O. Box 67

Minneapolis 1, Minnesota

What's Been Happening?

This column, a review of news reported in Croplife in recent weeks, is designed to keep retail dealers on rotational circulation up to date on industry happenings.

The Federal Food and Drug Administration took steps to eliminate duplication of fees charged to applicants for tolerance determinations on pesticides. Where supporting data for a product is similar for use in several crops, the original fee will cover. . . . American Potash Institute, Washington, D.C., announced that potash deliveries for 1954 were up 9% over 1953. A total of 1,834,810 tons K_2O content was delivered last year, amounting to 171,658 tons over the previous year's total.

Both output and export of pesticides were up in 1954, the USDA announced. BHC, DDT, 2,4-D were up in production, but 2,4,5-T declined. . . . The USDA also reported that farmers spent approximately $241 million for pest control, mostly for control of insects and plant diseases.

Spencer Chemical Co. announced a $1.5 million expansion in its nitric acid and ammoniating facilities at Vicksburg, Miss. The expansion will be completed in the spring of 1956 . . . Stauffer Chemical Co. announced that the new million dollar addition to its fertilizer plant at Vernon, Cal. will be turning out new products about the end of July, 1955.

Sohio Chemical Co., newly-formed subsidiary, will market the products of the $17 million petrochemical plant of the Standard Oil Co. now under construction at Lima, Ohio. The plant is expected to be completed about Jan. 1. . . . Survival of boll weevil was reported to be higher than average in Louisiana, giving rise to the possibility of infestation this summer. However, weather during June and July will determine actual conditions.

Prices on paradichlorobenzene and monochlorobenzene were reduced April 21, due to lack of demand at what is usually the peak buying season . . . Fertilizer sales in northern states was running from 10 to 15% behind those of the corresponding period last year, according to a survey made by the National Fertilizer Association in April. Prospects for improvement in the situation were reported as bright, however.

Brea Chemicals, Inc., completed a 210,000 gal. aqua ammonium phosphate plant at Fresno, Calif. The firm now produces both phosphate and nitrogen in solution form. . . . Curry Chemical Co. announced plans for construction of a 40-ton-a-day liquid mixed fertilizer plant near its present facilities at Scottsbluff, Neb.

USDA announced that it is studying materials that inhibit development of insects as possible control measures. Piperonyl butoxide showed promise in this area, USDA said. . . . Aerial spraying of some 800,000 acres in Massachusetts for gypsy moth control was expected to get under way around April 25. . . . Aron L. Mehring was named by USDA to head fertilizer work of Commodity Stabilization Services. He will direct continuing study on supply and demand conditions.

Davison Chemical Co., Division of W. R. Grace & Co., named F. Clayton Nicholson as vice president of the Division in charge of chemical operations. Mr. Nicholson succeeded W. B. McCloskey who became vice president of the parent company. . . . Olin Mathieson Chemical Corp. named managers for Agricultural Chemicals Division: John H. Nason, general manager of the eastern fertilizer division, at Baltimore; Joseph Mullen, Jr., general manager of western fertilizer division, Little Rock, Ark.

Fertilizer sales appeared to be about 5% behind those of a year ago in the South, ahead of last year in the California-Arizona area and about even with the board in the Arkansas-Oklahoma-Texas area, according to a report by the National Fertilizer Association. However, sales in the south were expected to be made up later in the season. . . . Foreign Operations Administration has allotted $5,151,000 to buy fertilizer materials for a project in India.

E. I. duPont deNemours & Co., Inc., announced operation of its East Chicago (Ind.) plant for production of sulfuric acid. The plant, capable of producing more than a trainload of sulfuric acid a week, was said to be the largest single unit of its kind in the world. . . . Shea Chemical Corp., Baltimore, announced plans for a $5 million expansion program that will double the firm's phosphate-producing capacity.

A U.S. Department of Commerce report stated that the fertilizer industry was in its best position in history to supply demand for plant food material this year. . . . Dr. Harold Gunderson, Iowa State College, became president of the North Central Branch of the Entomological Society of America at the group's annual meeting in East Lansing, Mich.

Corn borer damage in 1954 amounted to about 192 million bushels, worth more than $261 million, according to the U. S. Department of Agriculture.

Farmer planting intentions, as of March 1, indicated a 285½ million acre age in 16 crops this year—an increase of 3.2 million acres over 1954—according to the U.S. Department of Agriculture. Major increases were in feed grain crops.

The first annual meeting of the National Nitrogen Solutions Dealers Assn. was held in Omaha March 14-15. Wayne Johnson, Shenandoah, Iowa, was named president. . . . Phillips Chemical Co. acquired quarter interest in Farmers Corporation, a new firm established March 12 by the National Farmers Union and Kee-McGee Oil Industries.

Chas. Pfizer & Co. announced large-scale commercial production of itaconic acid on March 15. The material may have an application as base for insecticidal products, as a "building block" in the process. . . . Mackwin Co., Winona, Minn., developed a method of mixing pesticides with fertilizers in which the insecticide is sprayed onto fertilizer as the latter passes along a conveyor belt.

Cotton meeting at Phoenix, Ariz., March 8-9 brought out fact that systemic insecticides show "great promise" in pest control in cotton, but much more research is needed before full use comes. . . . U.S. Department of Agriculture pointed out that cost of fertilizer materials has increased less than any other commodity the farmer buys. Hired labor was listed as having increased over 300%, while fertilizer has gone up only 52%, compared to cost of 1935-3

ichigan Chemical come Shows Gain; fficers Renamed

T. LOUIS, MICH. — Michigan emical Corp. reported a net in- ne of $33,200 for the three months ded March 31, 1955, compared with oss of $209,100 before tax carry- k of $43,400 in the similar quarter 1954. This represents a profit of 06 against a loss of $0.30, after- rry-back, in the 1954 period for ch of the 537,077 shares out- nding.

Sales were $1,588,628 for the first arter of 1955, compared with $948,- 5 in the 1954 period.

At its annual organization meeting in Detroit, April 29, the board f directors of the firm reelected heodore Marvin, president and hairman of the board; Fred A. eMaestri, vice president; R. J. napp, treasurer; and Josephine M. urtiss, assistant secretary. Mr. napp also was elected secretary nd Mrs. Curtiss was also made assistant treasurer.

In his quarterly report to the stockolders Mr. Marvin stated that "parcular emphasis is being placed on rograms leading to the profitable ilization of excess insecticide manfacturing capacity. Work is now nderway to find new products which n be produced with this equipment, a minimum of additional capital ntlay. Progress is being made in this rection.

"While 1955 sales of insecticides date have been made in good olume, prices have remained unsatisctory. Forecasts for the sales of her products are good, and an imroved year is anticipated."

tauffer Chemical Renames Directors

SAN FRANCISCO—At the annual eeting of stockholders of the Stauffer Chemical Co. held in San Franisco recently, all directors were reected. Christian de Dampierre, hristian de Guigne, Elliott McAllister, Vincent H. O'Donnell, Hans tauffer, John Stauffer and Rollo C. heeler will again comprise the oard for the coming year.

In commenting on the results of operations for the first quarter of 1955, Christian de Guigne, chairman, told the stockholders that sales and earnings were at the highest rate in the company's history, and "represent in large part a fulfillment of the hopes of last year for the performance of the company's new plants and new products."

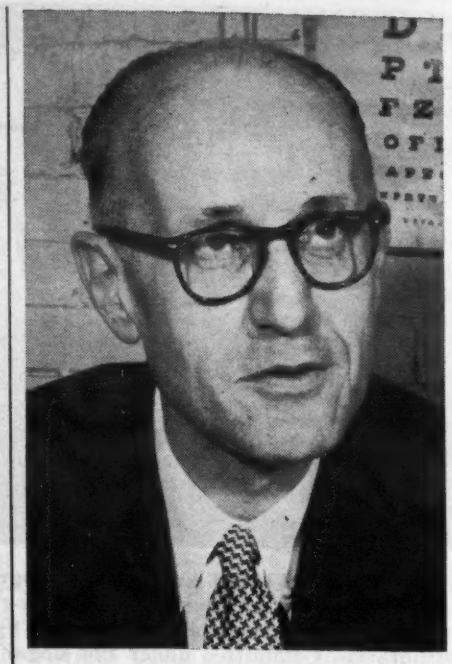
The increase in the quarterly dividend rate from 32½¢ per share to 7½¢ per share effective June 1, 955, was called to the stockholders' ttention.

In appraising prospects for the alance of 1955, Mr. de Guigne expressed confidence in the vigor of the ajor consumers of the company's roducts, both industrial and agricultural.

He pointed out that the development of new products is the most ignificant factor in the growth of ny chemical company. "For this eason the company's research and evelopment activities will continue o receive increasing funds and atention," he said.

CC Appointment

NEW YORK — Dr. Augustus B. inzel has been elected vice presient in charge of research, it was nnounced by Union Carbide & Carbon Corp. Dr. Kinzel is director of esearch at Union Carbide.



George L. Pelton

HEADS COMMITTEE — George L. Pelton, personnel director for the Smith Agricultural Chemical Co., Columbus, Ohio, has been named chairman of the Insurance Advisory Committee of the Fertilizer Safety Section, National Safety Council. One of the tasks of the new committee is to provide information pertaining to insurance rate structures and how the employer can protect himself against increased rates by following basic accident prevention practices. Mr. Pelton joined Smith Agricultural Chemical Co. in 1937 as timekeeper. He later was assistant superintendent of the Columbus plant, and in 1949 he was named personnel director. He was graduated from Ohio State University and did graduate work at Princeton University.

61 Fertilizer Firms Post Perfect Safety Records in 1954 Contest

CHICAGO — Winners in the 1954 safety contest within the fertilizer industry have been announced by the Fertilizer Section of the National Safety Council. Some 164 contestants completed the 12-month contest, covering a total of 33,316,000 manhours of work.

Of the plants in the contest, 61 ended the year with perfect safety records, while many others improved their records as compared to the figures for 1953. The per cent of decrease in 1954's final rate, compared to 1953, was 19%.

The contest bulletin states that there was a 53% increase in manhours worked in 1954, indicating stepped-up activity in the field. Total number of injuries for the year was 507.

Each award winner is to receive an attractive plaque, appropriately inscribed, from the National Safety Council.

Conditions Bad in Southwest Wheat Belt

AMARILLO, TEXAS — Conditions in the winter wheat belt of the Southwest are just about as bad this year as during any part of the drouth. East of the 100th meridian prospects are still good, according to a report by R. I. Cross, agricultural agent for the Santa Fe Railroad. On the west side and extending across New Mexico, much of the wheatland is almost bare, and only small areas recently visited by thundershowers have any prospects at all.

In many West Texas areas green bugs have been active, and farther east on the Rolling Plains the brown wheat mite has been doing some damage. Unless severely set back by insects, Mr. Cross says the quarter million acres of irrigated wheat in West Texas may boost the state's production to 15 million bushels.

4,050,000 Tons Synthetic Nitrogen Production Capacity Seen by 1957

MEMPHIS — Synthetic nitrogen production in the U.S. should reach an annual capacity of 3,444,000 tons by Jan. 1, 1956, according to information compiled recently by A. L. Mehring, Commodity Stabilization Service, U.S. Department of Agriculture.

Mr. Mehring's report is quoted in the current issue of Agricultural Ammonia News, publication of the Agricultural Ammonia Institute here.

He reported that the upward revision of some 318,000 tons in nitrogen capacity figures is based on revisions in completion dates for several plants.

If the new capacity estimate is reached by next Jan. 1, it will mean that the industry will be within 56,000 tons of its 3,500,000 ton capacity goal one year ahead of the target date, the institute points out.

Mr. Mehring's figures indicate that by Jan. 1, 1957, synthetic nitrogen production will be 4,050,000 tons—550,000 tons over the goal.

The U.S. Department of Commerce reported Feb. 1 that the industry had total production capacity of 2,840,000 tons, which represented an increase of 630,000 tons in one year. This increase resulted from 14 new plants or expansions of existing plants during the year.

The Commerce Department reported current annual nitrogen capacity in all forms at 3,100,000 tons.

The institute reports revised total anhydrous ammonia plant capacities, present and planned, in terms of tons of pure nitrogen as follows:

Region	Jan. 1, 1954	Jan. 1, 1955	Jan. 1, 1956	Jan. 1, 1957
Eastern	659,000	710,000	866,000	994,000
North Central	435,000	560,000	714,000	987,000
East So. Central	226,000	343,000	379,000	471,000
West So. Central	680,000	901,000	954,000	998,000
Western	194,000	271,000	531,000	600,000
United States	2,194,000	2,785,000	3,444,000	4,050,000

FERTILIZER USE

(Continued from page 1)

Colorado, Utah and Nevada, probably are running somewhat behind last year, but this is heavily influenced by the drouth situation in eastern Colorado where sales are off substantially and are not expected to recover completely. Reports indicate that farther west, sales probably are ahead of 1953-54 by as much as 5 or 10%.

Reports varied widely from area to area in this region, and any attempt to compare the situation in a local sales area with the indicated trend for the region as a whole could be misleading.

Weather conditions were mentioned most frequently as a factor in spring sales to date. It was also reported that the prospect of more plentiful supplies tended to reduce sales last fall, and to delay purchases this spring.

Reduced purchasing power on the part of farmers also was blamed by some who reported lower sales. This seems to have been true particularly east of the Rockies where drouth, however, was the principal factor.

In some areas, suppliers appear to have taken advantage of increased availability of fertilizer this year to boost sales. In some, such as central Washington, new acreages coming into cultivation for the first time this year also are expanding consumption

Dealers to Hear Talks On Fertilizer, Sanitation

JEFFERSON CITY, MO. — Dr. U. S. Jones, Olin Mathieson Chemical Corp. agronomist, will be one of the speakers on the program for the Missouri Grain, Feed & Seed Assn. annual convention, to be held here May 15-16. He will talk on "Principles and Economics of Fertilizer and its Importance to the Missouri Farmer in Regard to Today's Fertilizer Dealer." Also on the program will be Dr. M. H. Johnson, Douglas Chemical Co., Kansas City, who will discuss "How to Comply with Grain Sanitation in the Elevator and on Farms."

Gain in Use of Soil Insecticides Seen in Iowa

AMES, IOWA—One million acres of Iowa corn is expected to be treated this year by soil insecticides, according to Harold Gunderson and John Lilly, Iowa State College entomologists. An estimated 600,000 acres were treated in the state in 1954.

Olin Mathieson Sales Increase

NEW YORK — Domestic and Canadian sales of Olin Mathieson Chemical Corp. for the first quarter of 1955 ending March 31 were $121,175,381—9.7% above those of last year. Earnings from these sources were $8,007,911, compared with $7,581,976 in the same quarter of last year.

Domestic and Canadian earnings per common share for the quarter were 71¢, compared with 69¢ for the same period last year. In addition, foreign sales were $9,322,265 on which the company earned $684,953 or 6¢ per share.

The board of directors declared a dividend of 50¢ per share which was paid to the common shareholders on March 15, 1955. The regular quarterly dividend of $1.0625 on the $4.25 convertible preferred stock of the corporation has been declared payable on June 1, 1955, to holders of record May 17, 1955.

Burley Tobacco Growers Approve New Marketing Quota

WASHINGTON — Preliminary returns on the burley tobacco marketing quota referendum held April 28 show that 96% of the 333,090 growers voting favored marketing quotas, the U.S. Department of Agriculture has announced. Of those voting, 319,674 favored quotas for the 1955 burley tobacco crop. Only 13,416, or 4%, of the voters opposed the quotas.

Since more than the necessary two-thirds of those voting in the April 28 referendum favored quotas, the marketing quota program will be in effect for burley tobacco for the next marketing year, beginning Oct. 1, 1955.

The grower referendum, along with a redetermination of the 1955 burley quota, were called for by congressional action earlier this year. The redetermined quota is 334 million pounds for the 1955 crop, which replaces the quota of 478 million pounds, which had been proclaimed last November.

Beetle Campaign

CHEYENNE, WYO. — May 15 has tentatively been set for the start of a campaign against bark beetles in a 42 square mile area of Wyoming. Cost of the project this year is estimated at $3,690, according to Carl E. Johnson, Wyoming state forester. The program has been "very successful" the past two years, he said.

WORLD REPORT

Industry News from Everywhere

By GEORGE E. SWARBRECK
Croplife Canadian and Overseas Editor

The acreage to be sprayed with herbicides in western Canada this year may be an all-time high, according to Henry E. Wood, weed commissioner in Manitoba's Department of Agriculture. The record, established in 1950, was 13,566,000 acres.

Mr. Wood explained, "We are hoping for a marked increase in the use of chemical sprays on the basis that we're looking for a more normal year as far as weather is concerned."

In 1953 and 1954, Mr. Wood said, farmers had trouble in getting spraying outfits onto the fields, because the soil was so wet. Despite this difficulty, 11,179,000 acres were treated in one way or another at an estimated cost of $7 million. This estimate was made on the basis of 65¢ an acre for the herbicide itself plus the cost of application. Of the total treated, farmers in Manitoba sprayed 1,095,000 acres against a potential of 6 million acres of growing crops.

Western farmers in the three prairie provinces, at the present time, are spraying about one third of the total potential of 45 to 50 million acres a year.

Mr. Wood added, "We are just on the threshold in the use of chemicals for agriculture, especially in weed control. Now our scientists are tailoring chemicals to the specific weed jobs to be done."

Fertilizer-Insecticide

The agricultural chemicals department of Canadian Industries (1954), Ltd., is also tailoring supplies for specific uses.

Wireworms represent a major problem to the Newfoundland farmer and the chemists set to work to beat the problem. They have come up with a special 6-12-12 fertilizer mixture containing aldrin.

According to George Comrie, CIL's man-on-the-spot in Newfoundland, the inclusion of the insecticide in the fertilizer simplifies the application of the stomach and contact poison which kills not only wireworms but other harmful soil insects. Tests have shown excellent results with cabbage, potato and turnip crops, Mr. Comrie reports.

Indian Research

The government of India is moving ahead with its plan to improve agricultural production in the hope of achieving self-sufficiency in food. Part of the progress is directly attributable to the work of agricultural chemists and entomologists at the Indian Agricultural Research Institute. Recently Pandit Nehru, prime minister of India, was shown over the institute, and he voiced some high praise for the work being done.

The entomological division has one of the largest collections of named insects in the world with a total of 110,000 belonging to 15,000 species. There is a mycological herbarium, consisting of about 21,000 named specimens and an Indian type culture collection, consisting of over 900 distinct types of fungi and bacteria.

Various types of fungi, some living, others dead, are stored in refrigerated shelves. In glasshouses wheat and other plants are inoculated with rust and other plant epidemic viruses.

Fertilizer

In the agricultural and soil survey section scientists are evolving fertilizer from waste wool which is stated to contain about 10% nitrogen, from organic sources, and from wild leguminous plants, now unused, which collect nitrogen from the air.

The same section has constructed a cowdung gas plant which may be used on a large scale so that a good proportion of the 200 million tons of cowdung now being burned directly as fuel can be used for fertilizer.

The institute is also carrying out advanced experiments with radio-active isotopes to find how much of applied fertilizers and existing nutrients in the soil are absorbed by plants.

Narcotics

The British are using narcotics in an effort to get rid of a major pest in their fields—wild pigeons. Most birds are looked upon with favor by farmers because of their usefulness in destroying insects, but pigeons cause heavy damage every year.

The drugs are laid out in the fields or sprinkled on grain bait. Its effect on the pigeon is to stupefy it, and it can then be destroyed in the usual manner. The drug alone does not kill, and unless a bird absorbed an unusually large amount it wou'd recover eventually.

Rooks and crows are particularly susceptible to the effect of narcotics, and may be rendered unconscious for about two hours. However, the Ministry of Agriculture, responsible for making the experiments, reports that the pigeon is five times more difficult to stupefy because of its more complicated stomach formation.

The officials say that in view of the cost of the drug and the labor involved in laying out, supervising the operation, then killing the birds "it will not be a very cheap system."

Field trials are to continue during the next few months, and will be concentrated mainly in the pea-growing districts which are most seriously affected by the ravages of pigeons.

Victor Chemical Net For Quarter Declines

CHICAGO — Victor Chemical Works, manufacturer of phosphorus, phosphates and other chemical products, reports net earnings for the first quarter of 1955 of $904,111, which is equivalent, after deduction of preferred dividends of $98,108, to 50¢ per share on 1,599,121 common shares outstanding.

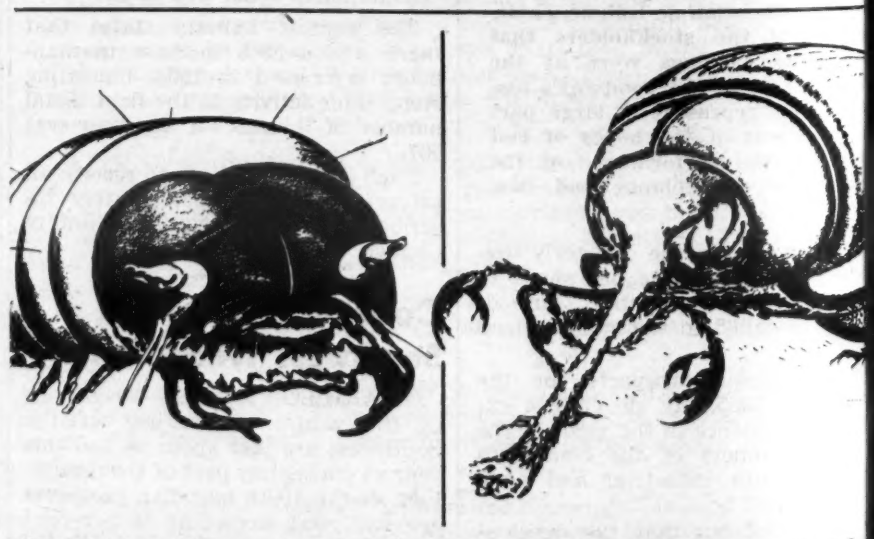
Net earnings for the corresponding quarter of 1954 were $939,200 which was equivalent, after deduction of preferred dividends of $121,169, to 53¢ per share on 1,534,900 common shares then outstanding.

FARM RECEIPTS

WASHINGTON—Cash receipts from farm marketings in the first quarter of 1955 totaled about $6.4 billion, down 5% from last year, according to the U.S. Department of Agriculture.

PUBLIC RELATIONS AWARD—A program to win widest public understanding of the threat of insect pests and to gain public support and participation in insect control, conducted last year by the Entomology Centennial Commemoration Committee under the slogan, "Fight Your Insect Enemies," has won a Silver Anvil Award of the American Public Relations Assn. John H. Smith, Jr., president of the association, is shown above presenting the award to David G. Hall, U.S. Department of Agriculture publications chief and chairman of the winning group. Edwin H. Ginn, right, manager of agricultural advertising for Hercules Powder Co., represents committee member M. R. Budd, director of advertising for Hercules who served with the group on behalf of the National Agricultural Chemicals Assn. Other Silver Anvil winners this year included General Mills, B. F. Goodrich, Columbia University, the National Broadcasting Co. and the Union Pacific Railroad.

AT SAFETY SUPPER — Approximately 300 employees of the Tenoroc and Coronet plants of the Coronet Phosphate Co., Plant City, Fla., a Division of the Smith-Douglass Co., Inc., of Norfolk, Va., attended a bar-b-que supper recently as a reward for having achieved an outstanding safety record. The Tenoroc plant had reached over 500,000 man hours without a lost-time accident, and the Coronet plant had gone six months without a lost-time accident. This placed these plants in second and third places respectively in the Annual Smith-Douglass Safety Contest between 17 S-D owned plants. Both plants received a Smith-Douglass presidential certificate of merit. Shown above at the award presentation are R. M. Wilbur, general manager, B. J. Phillips, division safety director, V. S. Gornto, Smith-Douglass safety director, G. F. Coope, flotation plant superintendent, and W. H. Taylor, general superintendent.



FEARSOME BUGS—The use of dramatized insects in current advertising by the Velsicol Corp. has resulted in a "very substantial increase" in Heptachlor sales, according to L. E. Carls, Velsicol advertising manager. "The over-sized, fearsome-type insect has become a trademark in Velsicol promotion," Mr. Carls said. The corn rootworm, left, and the alfalfa weevil, right, are currently being used in western, midwestern and eastern campaigns. "Both insects were drawn by use of low-power microscopes and then embellished to get a more animated effect," Mr. Carls said.

Trade Publications Given Safety Awards

CHICAGO—Croplife is one of 30 specialized publications named to receive a 1954 public interest award by the National Safety Council. Also named to receive the award, which is for "exceptional Service to Safety," are Agricultural Chemicals, Commercial Fertilizer and Farm Chemicals.

Effect of Fertilizer on Soil Moisture Utilization by Wheat

EDITOR'S NOTE — This article is reprinted from the current issue of the bulletin of the North Dakota Agricultural Experiment Station. It was written by J. C. Zubriski, assistant soil scientist, and E. B. Norum, soil scientist. The work described in the article was done with cooperation of the Branch Experiment Station superintendents: Miles White, Edgeley; Leslie Williamson, Hettinger; R. E. Douglas, Dickinson; Howard Olson, Williston; G. N. Geiszler, Minot, and Victor Sturlaugson, Langdon.

In North Dakota, where rainfall in many years is inadequate to supply the soil with enough water so crops can make maximum yields, farmers are concerned with soil management practices that conserve moisture so it may be used by crops.

Many farmers are using, with fair success, such practices as timely tillage, fallow, weed control, and intertilled crops in rotation for moisture conservation. This additional moisture contributes toward higher yields, though usually the moisture supply is still insufficient for maximum yields.

In addition to an adequate supply of moisture, crops must also have adequate supplies of available plant nutrients to produce maximum yields. Farmers' experience and results from field experiments have shown that phosphate fertilizers on fallow land and nitrogen and phosphate fertilizers on non-fallow land increase the yield of grain on a high proportion of soils in North Dakota.

Associated with increased yields, fertilized crops in many instances have been observed to have larger root systems, greater leaf area, taller straw and greater stooling. But what effect do these growth responses have upon utilization of soil moisture? Will the field that received fertilizer be drier at harvest than the corresponding field receiving no fertilizer?

To answer these questions, experiments at each of the North Dakota Branch Experiment Stations during the past three years weighed effect of fertilizers upon moisture status in the soil profiles of fertilized as compared to non-fertilized plots. At each location the relative amount of moisture depletion from the soil profile was determined with moisture blocks at approximately weekly intervals during the growing season.

Soil samples for moisture determination were taken at harvest time to depths of three to five feet. The yields of wheat, and the amount of water remaining in the soil profile are presented in the accompanying table.

In each of these trials, fertilizers increased the yield of grain. The increases ranged from 0.9 to 9.6 bu. per acre. In the majority of these trials the moisture remaining in the soil profile after harvest was about the same in fertilized and non-fertilized plots. Fertilizer did, however, advance the maturity of the wheat which resulted in corresponding earlier withdrawals of moisture from the soil profile.

From these data it is apparent that crop yields are improved from fertilizer usage even under conditions where soil moisture seriously limits the growth of the crops. It appears probable that if there is sufficient moisture in the soil to warrant seeding a crop, appropriate fertilizer should be used on soil believed to be deficient in available nutrients.

Effect of Fertilizers Upon Yield of Wheat and Soil Moisture Remaining in the Soil Profile After Harvest

Experimental site location	Yield of wheat, bu./acre Check	Fert.	Total moisture content of soil after harvest—acre inches‡ Check	Fert.
Fallow*—				
Dickinson, 1952	12.9	15.3	3.7	4.1
Dickinson, 1953	20.1	25.2	5.7	6.0
Minot, 1953	7.6	12.1	9.4	8.6
Minot, 1954	11.5	20.1	11.5	11.6
Non-Fallow†—				
Dickinson, 1953	10.7	16.2	4.7	4.0
Williston, 1953	8.9	13.5	3.2	3.4
Langdon, 1954	34.5	44.1	16.3	18.7
Edgeley, 1954	9.7	17.0	17.6	17.7
Minot, 1954	14.6	18.9	10.6	9.0
Hettinger, 1954	8.3	10.7	1.3	1.9
Dickinson, 1954	12.1	14.4	6.5	6.5
Williston, 1954	6.1	7.0	2.5	2.5

*Fertilizers used on fallow: 100 lb. per acre of 0-43-0 or its equivalent drilled in with the seed.
†Fertilizers used on non-fallow: 100 lb. per acre of 22-24-0 drilled in with the seed.
‡Total moisture in 5 ft. depth of soil, except 4 ft. depth at Williston and 3 ft. depth at Hettinger.

New Soil Test for Phosphate Being Widely Used in West

FORT COLLINS, COLO.—The new soil test for available phosphate which was developed at the U.S. Department of Agriculture's regional phosphate laboratory located at Colorado A&M, has been widely adopted throughout the West since its announcement a year ago.

Success of the test is evident since many commercial fertilizer companies and state soil testing laboratories are using it, according to Dr. Sterling R. Olsen, USDA soil scientist and a leader in the development of the testing method. The test indicates the crop needs for phosphate in the soil and helps in making recommendations on the amount of the plant nutrient that should be added.

Ordinary baking soda is used in the test to remove available phosphate from soil. The method has the advantage of being useful on a wider variety of soils than other tests, say the researchers. Also, results are more useful in predicting crop response to phosphate.

The regional USDA phosphate laboratory has been supplying basic information on phosphate fertilizer since its establishment at A&M in 1948. Scientists there expect to work on the problem of explaining the relationship between nitrogen and phosphorus in the fertilization of farm crops. These two nutrients are more commonly applied to western soils than any other fertilizers.

CASTOR BEAN YIELD BOOSTED

STATE COLLEGE, N.M.—Fertilization increased castor bean yields as much as 725 lb. per acre in tests last year at the Northeastern Substation of the New Mexico Agricultural Experiment Station. Yields of 1,889 lb. per acre were obtained with 80 lb. nitrogen per acre.

Fertilizer Helps Wheat Survive Drouth Periods

LINCOLN, NEB.—Fertilized wheat comes through drouth periods better than unfertilized wheat, R. A. Olson, University of Nebraska agronomist reports.

He says that the stronger root growth of winter wheat on fertile soil enables the plant to make better use of the deep-lying subsoil moisture. He bases his report on tests made in the Great Plains wheat belt area.

He says, however, that fertilizer use will not help overcome the effects of drouth where no subsoil moisture supply exists, or when a dry year begins with a shortage of moisture storage.

Winter wheat yields have been increased as much as 13 bu. per acre in Eastern Nebraska tests, when nitrogen and phosphate fertilizer was used. The net profits from the use of fertilizer averaged up to $16 per acre, Mr. Olson reports.

Fall applications of nitrogen have proved as effective as spring applications in increasing yields. Spring applications, however, have helped give the grain a higher protein content, Mr. Olson says.

Most Damaging Insects In Texas Listed

COLLEGE STATION, TEXAS — Cotton bollworms, grasshoppers and boll weevils were the three most damaging insects to Texas crops last year.

Aphids, rice weevils, cutworms, spider mites, thrips, armyworms and plant bugs complete the list of the state's 10 most destructive insect pests in their order of "economical importance," according to a report by Dr. J. C. Gaines of the department of entomology of the Texas A&M College System. Pink bollworms should be added to this list, Dr. Gaines says, not because of its present economic damage, but for its potential damage, to Texas cotton."

Canadian Firm

Sani-Pulp Corp., Montreal, reports that its new plant at La Salle, Quebec, will be completed by July 1, 1955. It plans to manufacture fertilizer and soil conditioners from refuse.

Insecticides for California Citrus Pests Reported

WASHINGTON—Research at the Whittier, Cal., station of the U.S. Department of Agriculture's Agricultural Research Service has shown that: 1. Against the California red scale on lemon and orange trees, most effective treatment is 1 gal. oil and 1 lb. 25% parathion to 100 gal. spray. 2. Against the citrus red mite on these same trees, best combination is 1.8 gal. oil and ½ lb. 25% parathion.

In terms of insecticidal effectiveness, these recommendations are clear-cut, entomologists say. However, tree safety must also be considered, and both combinations can cause excessive leaf drop, fruit drop, and, especially on oranges, twig dieback. Injury is more likely to occur if trees are under stress due to hot dry weather or other causes.

Neither combination should be used on damage-susceptible navel organges —particularly since parathion alone still provides good control of California red scale on this fruit. On Valencia oranges heavy with scale, growers can rely on a weaker combination spray in the spring—1 gal. oil and ½ lb. of 25% parathion—and follow with the heavier, recommended spray combinations in summer or fall, after harvest.

NEW OFFICE

NEW YORK—The New York officee of the Tennessee Products & Chemical Corp. have been moved from the Empire State Bldg. to 787 First Ave. The new telephone number is Murray Hill 3-2900.

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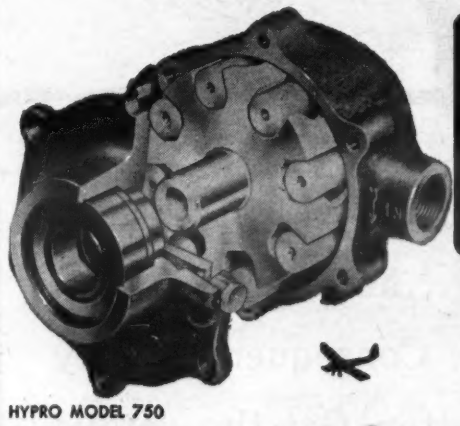
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Rotating Panel Discussions Featured at Third Annual California Fertilizer Conference

DAVIS, CAL.—Approximately 300 persons took part April 26 in the program of the third annual California Fertilizer Conference, sponsored by the Soil Improvement Committee of the California Fertilizer Assn., and held on the campus of the University of California, College of Agriculture, here.

All present took part in the open discussion which was promoted by three separate panels which rotated among three meeting rooms until all groups had participated in the entire program. Panel discussion was had on the subjects of field and forage crops with John Tollefson, Salinas, moderating; vegetable crops, Weir Fetters, Stockton, moderator, and deciduous and citrus fruit crops, moderated by Robert E. Whiting of Hayward.

Dr. H. J. Gramlich, former head of the Department of Animal Husbandry, University of Nebraska, and more recently director of agricultural development for the Chicago and Northwestern Railway System, spoke following the banquet.

He said that there have been more changes in agricultural practices throughout the world in the last 50 years than in the 2,000 preceding years, most of which occurred during the last ten years. During this period, use of plant food has increased 3½ times as the result of new knowledge gained as to the value of commercial fertilizer and new technology in its production, he said.

Population in the U.S. is growing by almost three million per year. Not only must more food be provided, but housing and service facilities must be erected as well. Much new building is on land being taken out of agriculture, said Dr. Gramlich. One million acres of farm land has been so utilized each year since 1940.

Another trend, he said, is the movement from the farm to the city. Fifty years ago almost half of our people lived on the farm. Today, 87% live in the city. Dr. Gramlich pointed out that there is no new land area to be developed agriculturally, and that the shrinking acreage available must be made to produce all of our increasing food and fiber needs. Fertilizer, he said, is a very necessary tool for the performance of these needs.

The morning program was devoted to several outlines. B. H. Jones, president of Sunland Industries, Inc., Fresno, and of the California Fertilizer Assn., welcomed those present and thanked the officials of the University of California for the use of its facilities and for their active assistance in arrangements and in participation in the program for the conference.

M. E. McCollam, western manager, American Potash Institute, Inc., San Jose, and chairman of the association's Soil Improvement Committee, reported that thorough sampling and testing of at least 130 California soil types have shown about 30% of these types to be low to very low in potassium level by the Neubauer standards.

These low potassium readings occurred most frequently on the sandy and sandy loam soils of the east side of the San Joaquin Valley, in the coastal areas, the coastal valleys of central California, in southern California and in the northern Sacramento Valley. During this research interest increased in the chemical analysis of plant leaves as a more accurate guide to plant nutritional requirements, Mr. McCollam said.

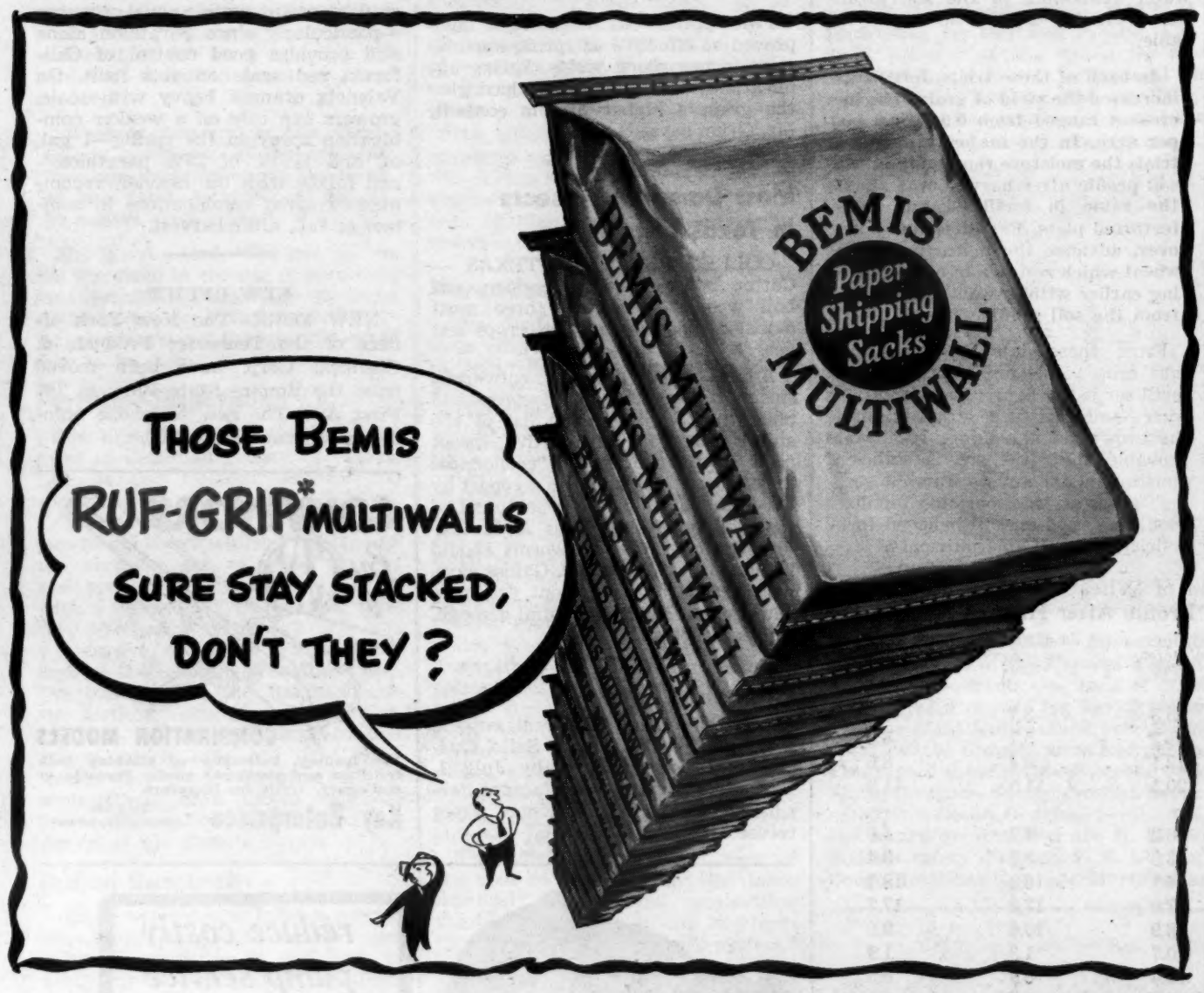
Dr. Stanley Freeborn, provost, University of California at Davis, outlined the programs of the university and other land-grant colleges which train students in agriculture and other subjects. He pointed out that during a period when the country's population has been increasing by several hundred-per cent, the enrollment of basic agriculture students has increased by only 2 to 3%. "Around 1900," he said, "it was feared that the population was increasing out of proportion to the ability of agriculture to increase its production. At that time, it took 85 farm people to produce food and fiber for 100 persons.

"Now, only 10 farm people produce enough for the needs of 100. While famine is rife in other parts of the world, we, in the U.S., have been able to keep ahead of our needs because of technical progress in agriculture." He said that more students should consider entering some of the satisfying professions in the field of agriculture.

LeVerne N. Freimann, extension agent, Whatcom County, Bellingham, Wash., outlined the results obtained at the Benedict demonstration farm which has been operated as a project during recent years in his county. This 100-acre dairy farm had been cropped until its productive capacity was nearly exhausted. For this reason, it was chosen by a group of representatives of Washington State College, Farmers' Home Administration, Soil Conservative Service, banks, farm equipment dealers and the fertilizer industry as an ideal place on which to stage a fertilizer demonstration.

As the result of proper fertilization and other approved farming practices, this once unproductive land which had been unable to sustain 14 milk cows and 18 head of young stock was, within three years, supporting more than three cows per acre on the ladino and orchard grass pasture, and the herd had been increased to 32 milk cows! Sufficient surplus feed is now produced during the growing season to allow storage for winter feeding. Mr. Freimann spoke of the experiment as an "outstanding success."

A. George Park, Balfour, Guthrie & Co., Ltd., San Francisco, reported on the current results of 13 large scale rangeland demonstrations sponsored by his firm in nine California counties. Beginning in 1952, the tests have been very encouraging. Now in their third year, the demonstrations cover over 3,000 acres, involving 1,289 beef animals and about 650 pairs of ewes and lambs. The land owners



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Robert Z. Rollins, assistant chief, alifornia State Bureau of Chemistry, acramento, outlined many of the ewest problems which attend the rowing use throughout the country pesticide-fertilizer mixtures. "In alifornia," he said, "such mixtures ust be registered under both the rtilizer control laws and those per-ining to the control of pesticides. n addition, they must conform to the hedule of tolerances recently placed n effect by the Federal Food and rug Administration."

It is also important that the pesti-ide material involved be chemically ompatible with the fertilizer ingre-ients, he said. California produces ver 200 commercial crops, making ecessary a large range of pesticides or adequate control. This poses roblems which do not exist in other reas. The result has been that so ar, demand for these mixtures has ot grown as rapidly in California as t has elsewhere.

The morning session was com-leted by showing the film "California rows With Fertilizer," a 16 mm. olor film in sound.

INSECT NOTES

(Continued from page 5)

ers small grains, corn and grasses, t also will attack many other crops including cotton) when hungry.

For control, use 15 to 20 lb. 20% oxaphene an acre or 3 to 4 lb. actual oxaphene an acre as a spray. Do not reat feed crops within 21 days of harvest.—C. R. Jordan.

Cutworms Infest Cotton in Alabama

AUBURN, ALA. — Reports from several Alabama counties of serious cutworm and armyworm damage to crops have prompted a warning to other farmers in the state to be on guard against these pests.

A heavy infestation of cutworms cleaned out fields of cotton in Houston County last week. An outbreak was reported in Baldwin County a little earlier, and corn fields in Macon County were destroyed by cutworms even before the late March freeze.

In the West Central and Northwest parts of Alabama, migratory armyworms have moved across several counties destroying fields of small grains and pasture.

W. A. Ruffin, API Extension entomologist, in reporting the cutworm threat to newly-planted crops, pointed out that these insects have been especially troublesome in fields where cover crops have been turned under. He expressed fear that other crops planted behind green cover will be hit by the worms. For control of both armyworms and cutworms, he recommended an immediate dusting with 20% toxaphene.

More Insects Likely, New Mexico Says

STATE COLLEGE, N.M.—Grasshoppers are beginning to hatch in very small numbers in the lower half of the state. Only the very early non-economic species are involved and these appear to be hatching in areas which would retain moisture longest. Mayflies are appearing in small numbers around street lights in the Mesilla Valley.

Cutworm moths are flying in large numbers indicating the possibility of large numbers of worms later. Ant lion adults appeared at night lights for the first time in 1955 on April 23. Aphids are attacking roses, chrysanthemums, and ornamentals in large numbers.

The Arborvitae aphid has shown up on Arborvitae throughout the southern half of the state in ornamentals planting and in some places is causing considerable worry.

TRANSPORT POLICY

(Continued from page 1)

plex issue for their members. Those involvements become so delicate company by company that it is unlikely that any of the plant food groups can define the industry position.

For example one of the committee recommendations is one which would give to the railroads permission to grant discount tariffs on trainload shipments of bulk commodities such as sulphur or potash.

The most extreme example might be the movement of potash from New Mexico to the eastern seaboard. On the surface this might seem an incentive for the domestic producers to favor the committee recommendations.

On the other hand importers bringing in off-shore supplies to the East Coast or to Gulf ports could obtain the same trainload discounts and move farther into the interior.

The transportation policy report is one of the most complicated issues which will face Congress. It is unlikely that Congress will consider it at this session.

The recommendations include a drastic overhaul of the Interstate Commerce Commission Act wherein the ICC would have its authority over rail rates reduced to setting a minimum-maximum range, within which the individual carriers could fix their own tariffs, subject to publication. The proposals also would permit the carriers to compete with barge rates and require the barge carriers to publish their tariffs on bulk commodities.

Also involved is the problem of truck rates and the impact of private carriers as compared with certified and contract carriers.

Authorizations for Fertilizer, Pesticides Announced by FOA

WASHINGTON — Several authorizations for purchase of fertilizer and pesticides were announced last week by the Foreign Operations Administration. They were to:

India, $4 million for nitrogenous fertilizer materials, with procurement to be made from world sources.

Pakistan, approximately $40,000, with $39,000 for phosphates and the balance for potash. Procurement is on a world basis.

Indonesia, $991,221 for pesticides to be obtained from the U.S. through the General Services Agency.

Iran, $326,797, for pesticides to be obtained from the U.S. through GSA.

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A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The rotational circulation of this issue is concentrated in the Western states.

Outline Legal Responsibility

Several thousands of airplanes engaged in agricultural spraying and dusting activities will be aloft this season applying chemical compounds for the control of various pests. The number of operators seems to increase year after year, with more experienced pilots and sounder companies back of them.

It is encouraging to note their increasing interest in and attendance at state meetings of airplane operators, and their sober acceptance of responsibilities involved in this type of work.

Some of the subjects discussed at these state gatherings include the properties of pesticides and herbicides . . . warnings and "do's and dont's" in handling and applying toxicants and instructions on liabilities involved.

In a recent such meeting of aerial applicators at Purdue University, C. K. Ganong of Purdue outlined to the fliers the extent to which their legal responsibilities go. We think that some of the points he made are well worth passing on to a wider audience.

Mr. Ganong's objective was to make those engaged in custom flying more conscious of the nature of the risks they run and by pointing out their legal rights to lessen the likelihood of their being held liable for injuries not caused by them. "This applies to all persons directly or indirectly connected with crop dusting activities from the manufacturer of the insecticide or herbicide used, to the pilot or applicator," he said.

"The basic principle upon which the liability of crop owners, in crop dusting cases, rests, is a property owner must so use his property as not to interfere with others in the 'reasonable use or enjoyment of their properties.' What applies to the crop owner applies also to those employed by him.

"This principle of reasonable use comes down to us from Rome through the common law of England and is of wide application. To take an example outside the crop dusting field: in a recent case the owner of a private airport sought an injunction to restrain an adjoining landowner from building a drive-in-theater on the ground that it would interfere with the operation of his airport. The court ruled one landowner had as much right to use his land for a drive-in-theater as another had to use his as an airport.

"In like manner one landholder has just as much right to grow cotton as another has to grow rice and vice versa. Thus, if a grower of rice dusts or sprays his crop with 2,4-D and some of it drifts from his land to the land of a grower of cotton and does injury to the latter's crop, the farmer is liable for such injury. This is because the activity in which the rice grower engaged on his own land interfered with the cotton grower in the reasonable enjoyment of his land.

"It is to be noted that the liability of the rice grower under the circumstances given would be a 'nuisance.' In other words, to render himself and his employer liable for injury done to an innocent party by crop dusting, it is not necessary for the pilot or applicator to be guilty of either trespass or negligence.

"It is not unusual, however, for 'nuisance' to arise out of negligence. This is true when apart from the negligence of the applicator, no dust would have drifted upon the land of another. In this reasoning, negligence on the part of the applicator is alleged in most crop dusting cases.

"The crop duster, as doer of the act which results in injury, is personally liable in damages. The liability of the crop owner is not instead of, it is in addition to, the liability of the crop duster.

"That both crop owner and crop duster are liable in damages is due to the fact that crop dusting is an activity to which the doctrine of strict liability applies. This is to say, a crop owner cannot avoid liability on the ground that the crop duster employed by him was acting as an independent contractor."

Does the manufacturer, distributor or dealer figure in the liability thus imposed? Not so, says Mr. Ganong, unless the products used were not properly manufactured, not thoroughly tested nor correctly labeled.

There is no reasonable question about the manufacturer's being thorough in all points in connection with his offering a toxicant on the market. State and federal registration of such materials assures the buyer that the insecticide, fungicide or weed killer is up to specifications and that labels and instructions for use are adequate.

Those handling the materials beyond this point must be sure that everything is done in accordance with the rules. Aerial dusting and spraying are of tremendous value to agriculture and offer a sizeable market to the pesticide trade. Everyone concerned will be happier, healthier and more prosperous if maximum care is exercised all along the line as the pesticides are applied.

Pesticide Industry Report

That there will be an ample supply of insecticides, fungicides and weed killers for the entire 1955 season is not particularly news to the trade, but there does seem to be a good omen in the report that inventories are being kept at more realistic levels than at any time in recent seasons.

"The Pesticide Situation for 1954-55," just issued by the U.S. Department of Agriculture and prepared by Harold H. Shepard, states that over-all inventories of both technical materials and the chemical content of formulations, were down about 9% on September 30, 1954, as compared to the same date in 1953. Stocks of technical grades of pesticidal chemicals in the hands of all manufacturers, including mixers, showed a reduction of about 16% from 1953 levels.

A review of 1954's pesticide season brings back sad memories for some, while others regard the season as having been satisfactory. Mr. Shepard's report reminds that while drouth conditions prevailed throughout the south and southwest, reducing insecticide volume; elsewhere, grasshoppers, armyworms and other insect pests brought about brisk demand for various pesticidal products.

Production figures on different toxicants during the past year hold some significance. It indicates that even though some of the newer pesticides have shown outstanding insect control properties and thus have gained a good following, the older types of materials are still in the picture. Total figures on production and consumption indicate that insecticide use on a national scale is considerably more than it was in past years.

One significant factor in the picture is the increasing number of pounds of insecticides applied by aircraft, particularly in spray form. Where dusts were applied more in 1951, spray applications have increased from 27 million gallons in '51 to over 47 million gallons in 1953.

Still another important development is the increasing use of soil pesticides, particularly for control of corn rootworm. In Iowa, this increase has been particularly spectacular, the total number of acres treated rising from 25,000 in 1952 to 600,000 last year. The same story is true of other midwestern states, with the total acres treated in Iowa, Illinois and Nebraska being set at 2,465,000.

Well, everyone in the trade seems to be looking to 1955 as the year when real prosperity returns to the pesticide industry. It looks like it could well be, if the price structure can be kept intact. THAT is the question.

CROPLIFE is a controlled circulation journal mailed to those responsible for the production and distribution of fertilizer and other farm chemicals and to retail dealers of the agricultural chemical industry in the U.S. To those not on the controlled list, CROPLIFE is available at $5 for one year, $9 for two years ($8 a year outside the U.S. and possessions). Single copy price, 25¢.

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MEETING MEMOS

May 15-17 — Chemical Specialties Manufacturers Assn., Drake Hotel, Chicago; H. W. Hamilton, 50 E. 41st St., New York 17, N.Y., executive secretary.

May 19—Fertilizer Section, 25th Annual North Carolina Safety Conference, Robert E. Lee Hotel, Winston Salem, N.C.; William C. Creel, Safety Director, Department of Labor, State of North Carolina, Raleigh, Chairman.

June 2 — South Carolina Fertilizer Meeting, Sandhill Experiment Station, near Columbia, S.C.

June 3—Fertilizer Section, Virginia State Safety Assn., Jefferson Hotel, Richmond, Va.; William C. Richardson, Southern States Cooperative, Richmond, Chairman.

June 12—Executive Committee, Fertilizer Section, National Safety Council, Roanoke, Va.; Thos. J. Clarke, GLF Exchange, Ithaca, N.Y., Chairman.

June 12-15—Joint meeting, American Plant Food Council, Inc. and National Fertilizer Assn., Greenbrier Hotel, White Sulphur Springs, W. Va.; Paul T. Truitt, American Plant Food Council, 910 17th St. N.W., Washington, D.C., in charge of registration.

June 21—Western Agricultural Chemicals Assn., Spring Meeting, Clark Hotel, Los Angeles; C. O. Barnard, 2466 Kenwood Ave., San Jose 28, Cal., Secretary.

June 22—Pacific Slope Branch, Entomological Society of America, Mission Inn, Riverside, Cal.

June 28-30 — Sixth Annual Pacific Northwest Plant Food Assn., Regional Fertilizer Conference, Boise Hotel, Boise, Idaho; Leon S. Jackson, 702 Lewis Bldg., Portland, Ore., Secretary.

July 5-8—Plant Food Producers of Eastern Canada, Bigwin Inn, Muskoka, Canada.

July 14-15—Southwest Fertilizer Conference and Grade Meeting, Buccaneer Hotel, Galveston, Texas.

Aug. 8-10 — Summer Meeting of North Central Division, American Phytopathological Society, Wooster, Ohio; further information from H. C. Young, Dept. of Botany & Plant Pathology, Ohio Agricultural Experiment Station, Wooster, Ohio.

Aug. 9-11—Ohio Pesticide Institute Meeting and Field Tour, Wooster, Ohio; Dr. J. D. Wilson, Ohio Agricultural Experiment Station, Wooster, Secretary.

Aug. 10—Kentucky Fertilizer Conference; Guignol Theatre, University of Kentucky, Lexington.

Aug. 15-19 — American Society of Agronomy and Soil Science Society of America, University of California, Davis Campus.

Aug. 15-20—Farm & Home Mechanization Pageant, Michigan State College, East Lansing, Mich.

Sept. 7-9 — National Agricultural Chemicals Assn., Spring Lake, N.J.; Lea S. Hitchner, NAC Executive Secretary, 1145 19th St. N.W., Washington 6, D.C.

Sept. 7-9 — Ninth Annual Beltwide Texas A&M College, National Cotton Council of America, Box 18, Cotton Mechanization Conference, Memphis 1, Tenn.

Oct. 17-18 — Fertilizer Section, National Safety Congress, LaSalle Hotel, Chicago; Thomas J. Clarke, Chairman.

Nov. 2-3 — Annual Convention, Pacific Northwest Plant Food Assn., Pilot Butte Inn, Bend, Ore.; Leon S. Jackson, 702 Lewis Bldg., Portland, Ore., Secretary.

Nov. 7-8—California Fertilizer Assn., Thirty Second Annual Convention, Hotel Mark Hopkins, San Francisco; Sidney H. Bierly, Executive Secretary & Manager, 475 Huntington Drive, San Marino, Cal.

Nov. 29-Dec. 2 — Entomological Society of America, Netherlands Plaza Hotel, Cincinnati.

Dec. 5-7—Agricultural Ammonia Institute, Kansas City; Jack F. Criswell, Executive Vice President, Claridge Hotel, Memphis, Tenn.

Dec. 28-30 — American Phytopathological Society, Atlanta, Ga.; Glenn S. Pound, University of Wisconsin, Madison, Wis., Secretary.

1956

Jan. 4-6—Weed Society of America, Charter Meeting, Hotel New Yorker, New York, W. C. Shaw, U.S. Department of Agriculture, Beltsville, Md., Secretary-Treasurer.

Jan. 26-29 — Agricultural Aircraft Assn., Inc., Sixth Annual Convention, Wilton Hotel, Long Beach, Cal.; Wanda Branstetter, Route 3, Box 1077, Sacramento, Cal., Executive Secretary.

Feb. 15-17—Western Weed Control Conference, Sacramento and Davis, Cal.; W. C. Robacker, U.S. Department of Agriculture, Nevada Agricultural Experiment Station, Reno, Nev., Secretary-Treasurer.

Feb. 15-17—California Weed Control Conference, Sacramento and Davis, Cal.; Oliver A. Leonard, Botany Dept., University of California, Davis, Cal., Secretary.

LEADS THE NATION

FRESNO, CAL. — Fresno County, Cal., led the nation in agricultural production in 1954 for the seventh consecutive year, according to John W. Dixon, county agricultural commissioner. He reported that $317,683,314 worth of farm products were grown or grazed in the county in 1954.

Classified Ads

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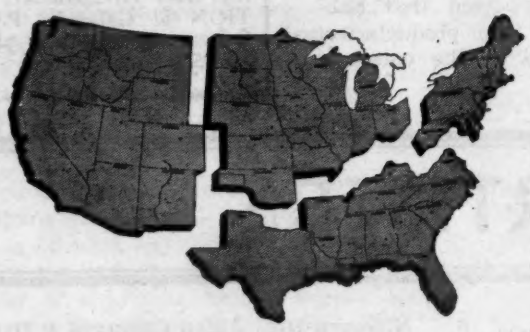

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